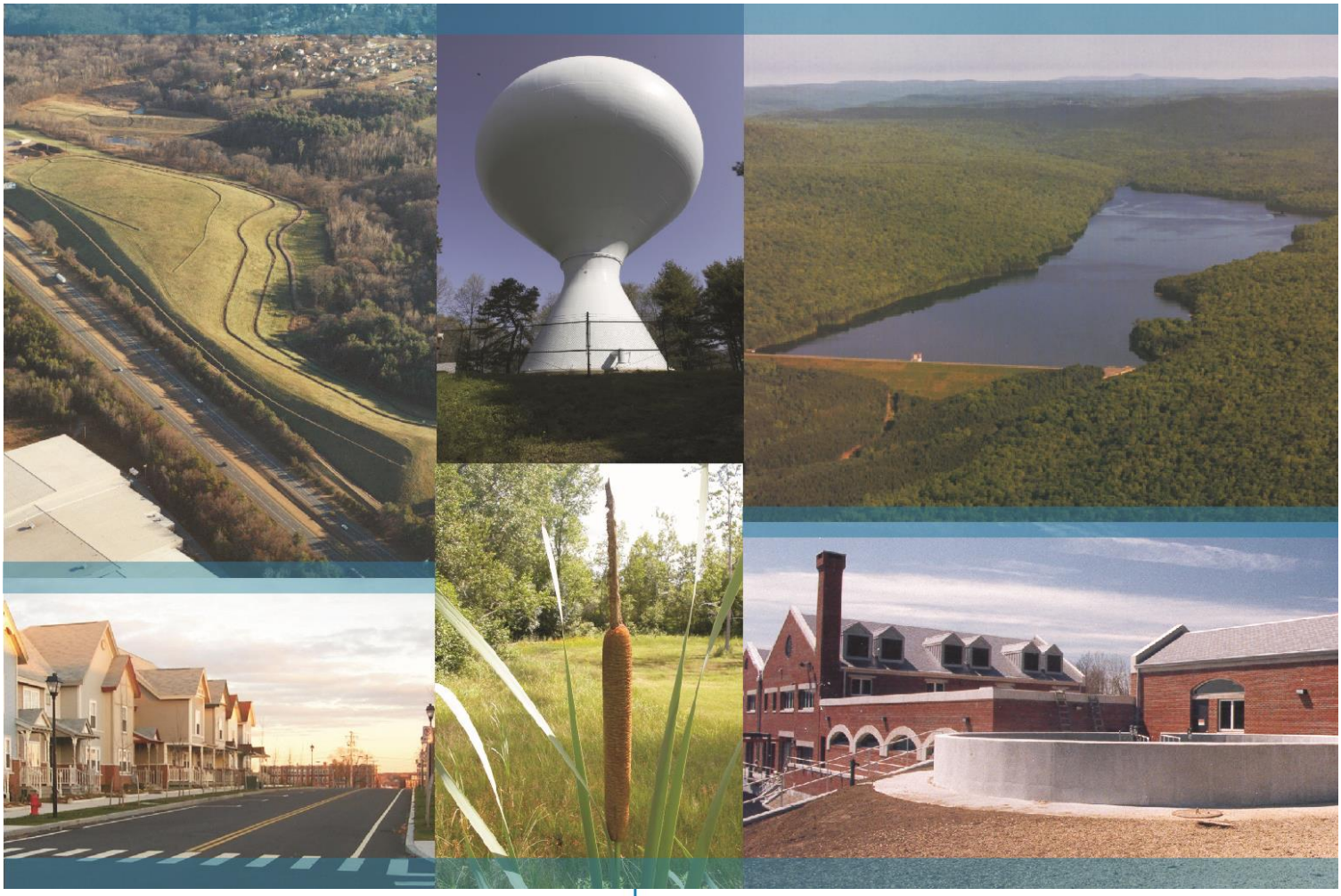
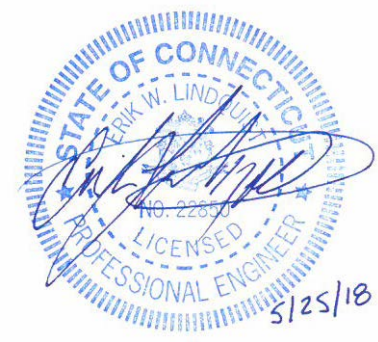
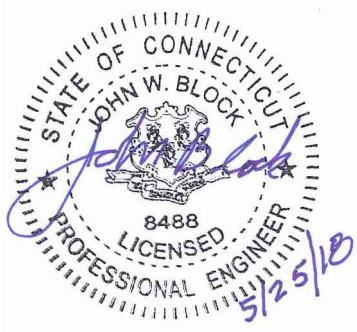






Tighe&Bond

26 East Lane
Darien, CT

Engineering Report

Prepared For:

Baywater Housing Partners, LLC
Darien, CT

May 25, 2018

Section 1
Introduction and Site Conditions

Tighe & Bond has prepared this report in connection with Baywater Housing Partners proposal to construct two residential buildings with 12 total apartments on the 26 East Lane property in Darien, CT. Please refer to **Figure 1**, Site Location Map, in **Appendix A** for the location of the site.

Tighe & Bond is familiar with the property, and has reviewed and analyzed available utility information and topography. Drainage calculations and stormwater management plans have been prepared in accordance with the Town of Darien Stormwater Management and Drainage Manual, Connecticut Department of Transportation Drainage Manual 2000 and the Connecticut Department of Energy and Environmental Protection 2004 Stormwater Quality Manual. The drainage calculations include a hydrologic and hydraulic analysis of the pre-existing conditions and the proposed development. More specifically, the calculations include an analysis of the on-site stormwater management measures and their performance in handling peak flow attenuation and suspended solids removal rates. Lastly, the report also includes the proposed soil erosion and sedimentation control measures incorporated during construction and operation and maintenance of the drainage and stormwater management systems.

1.1 Existing Conditions

The site area consists of 0.9045 acres, generally bounded on the west by I-95, on the north by 22 Wakeman Road, on the east by 150 Old Kings Highway, and on the south by 28 East Lane.

The site consists of an existing residential building, a detached daycare facility, driveways, lawn, and perimeter trees and lightly wooded overgrowth, including a vegetative buffer along the I-95 highway non-access line running adjacent to the sound barrier. There is a high point in the central portion of the site with approximately half the site draining to the north and half to the south towards East Lane. There is no existing stormwater collection system on or immediately adjacent to the property. Runoff in the northern section of the site drains overland towards 22 Wakeman Road to an off-site wetland area that runs parallel to a CT DOT drainage swale. Runoff in the southern section of the site flows either overland through 150 Old Kings Highway property or down the existing driveway towards East Lane where it currently ponds at the end of the cul-de-sac prior to overflowing under the sound barrier and towards a drainage structure along the I-95 northbound on-ramp.

1.2 Proposed Conditions

The proposed site will consist of two new residential buildings, concrete sidewalks, on-grade parking, site utilities, and a stormwater management system. The proposed design includes 12 parking spaces and the site will be approximately 35% impervious.

Stormwater management will be accommodated on-site. Surface runoff will be collected and conveyed in a series of catch basins, yard drains, roof leaders, and a swale. The stormwater collection system will utilize a “treatment train” approach and include low impact development systems to treat the Water Quality Volume, remove total suspended solids and reduce peak flow.

The sanitary sewer from the proposed buildings will discharge to the existing 8" sanitary sewer located in East Lane. This will include a small grinder pump for the rear building which will pump up the hill to an on-site manhole where both buildings will combine and flow by gravity out to the existing sanitary manhole in East Lane. Water, Electric, and Tele-Data services will be provided from existing services located in East Lane.

1.3 Site Soils

A wetland delineation and Soil Report was prepared by Pfizer Jahnig, Environmental Consulting, dated May 17, 2018, indicated the site and immediate surrounding area is predominantly made of Charlton-Chatfield complex which is classified hydrologically as a Group B, well-drained soil. These soils are formed in loamy melt-out till and are moderately deep to bedrock.

Additionally, the area to the north of the site consists of Saco Silt loam. Saco Silt loam is generally poorly drained and subject to frequent flooding. The off-site area adjacent to the I-95 drainage discharge point was identified as a wetland area and the subsequent wetland flags have been shown on the project survey.

Section 2
Stormwater Management

2.1 Existing Site Hydrologic Analysis

The existing conditions hydrologic analysis is comprised of four subwatershed areas and a design point for each watershed at the location where runoff leaves the 26 East Lane property. The existing watersheds are a mix of impervious and pervious areas; however, the existing conditions were analyzed under pre-existing, meadow conditions (See Existing Watershed Map in Appendix).

Runoff to the north flows towards 22 Wakeman Road where it ponds off-site in a wooded area before eventually crossing the property's driveway in more intense rainfall events. The runoff ultimately drains to a nearby wetland system that starts on the north side of the 22 Wakeman property. Runoff from the southwest area of the site flows down the existing driveway towards East Lane where it locally ponds at the end of the East Lane cul-de-sac prior to discharging northwest towards an existing swale adjacent to the I-95 ramp and sound barrier. Runoff from the southeast of the site flows overland towards 150 Old Kings Highway.

Watershed areas, curve numbers, and times of concentration were calculated for each watershed and inputted into a hydrologic model to determine the project's peak flow as part of the comparative hydrology analysis. A curve number of 69 was used for the entire site to represent pre-development meadow conditions consistent with Darien standards for comparative hydrology analysis.

A breakdown of exiting watershed areas, existing volumetric hydrographs, and an existing watershed map are included in **Appendix C** of this report.

2.1.1 Floodplain Management

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for Fairfield County shows the project site is outside of any floodways or floodplains, as shown in **Figure 2** in **Appendix A**. Therefore, no floodplain is identified on or adjacent to the project site.

2.2 Proposed Site Hydrologic and Hydraulic Analysis

The proposed conditions hydrologic analysis also includes four subwatershed areas which encompass the site and the same design points as described above. The proposed site is a mix of pervious and impervious, with 35% of the site covered by building and associated hardscape. In general, the overall runoff patterns of the site will remain unchanged by the proposed site grading; however, a majority of the proposed hardscape will be routed to the north stormwater management system. The high point in the site remains unchanged along with the general discharge points of each of the four watersheds. In the north, the new parking lots, sidewalks, and driveway will flow overland to a new swale with a 12-inch stone drainage strip and an underground infiltration system running parallel to the northern most parking area. The swale acts to collect overland flow from the site, and infiltrate it into perforated pipes and a stone reservoir below grade to promote infiltration while providing storage to attenuate peak flow leaving the site. The buildings and adjacent landscaped areas will drain to yard

drains and roof leaders and be conveyed directly into an underground infiltration system. The pervious area along the northeastern portion of the site will maintain its existing runoff patterns and continue to flow overland off-site.

Since there is no adjacent existing drainage system in East Lane, the proposed site in the southern portion of the property will maintain its existing drainage pattern. The associated water quality volume and peak flow will be attenuated prior to leaving the site with the use of a 6-FT diameter dry well fitted with a type 'C' catch basin top. During more intense storms the drywell will fill with runoff and gutter flow will bypass the structure and continue to the end of the cul-de-sac as it does under existing conditions.

In general, the stormwater management system for the entire site will maintain existing drainage patterns while providing low impact development practices and stormwater treatment by fully infiltrating the Water Quality Volume (WQV). In addition, the drainage structures and pipes have been sized to convey the 25-year storm event as per the Town of Darien requirements.

The stormwater management system has been designed to treat the WQV, remove total suspended solids (TSS) and reduce peak flow. The WQV was calculated as 903 CF for the portion of the site that drains north, and 293 CF for the portion of the site that drains south. These were calculated using the Connecticut Department of Energy and Environmental Protection 2004 Stormwater Quality Manual and are consistent with the Town of Darien Drainage Manual. To treat the WQV, the stormwater management system utilizes an infiltration system and dry well as primary treatment.

Due to the existing soil conditions, underground detention with infiltration is a viable option for stormwater management. We have assumed an infiltration rate of 1-inch per hour in accordance guidelines from the Connecticut Department of Transportation Drainage manual.

Table 1 below shows the peak discharge from existing to proposed for the 2, 10, 25 and 50-year storm events.

Table 1

Summary of Stormwater Peak Discharge (CFS)

		Frequency (years)				
Discharge Location	**Condition**	**2**	**10**	**25**	**50**	**100**
Design Point N1	Meadow	0.325	0.807	1.144	1.144	1.687
	Proposed	0.000	0.000	0.260	0.934	1.531
Design Point N2	Meadow	0.273	0.673	0.955	1.183	1.416
	Proposed	0.132	0.337	0.483	0.600	0.720
Design Point S1	Meadow	0.161	0.398	0.565	0.698	0.833
	Proposed	0.138	0.391	0.512	0.601	0.689
Design Point S2	Meadow	0.289	0.671	0.934	1.149	1.368
	Proposed	0.146	0.375	0.536	0.665	0.797

In an effort to mitigate the existing drainage impacts to 22 Wakeman Road to the north (Design Point N1), the project proposal will include coordination with the CTDOT for the construction of a new drainage swale from the northern most corner of the site to the CTDOT drainage swale adjacent to both properties. In addition, over the years the

CTDOT swale has filled with sediment and debris that effectively diverts runoff onto the 22 Wakeman Road property exasperating flooding issues. By coordinating the maintenance of the swale with the CTDOT and routing the overflow from the underground infiltration system into the existing swale as well, the project will be able to discharge more directly to the existing wetland system north of the site and help improve localized flooding currently experienced on the 22 Wakeman Road site. The on-site stormwater management system has been designed to mitigate stormwater runoff and the proposed project will not increase peak flow from the site and will help mitigate existing flooding concerns on the neighboring downstream property.

The proposed watershed maps, watershed areas, storm sewer calculations, hydrographs, Water Quality Volume and Flow calculations are included in **Appendix C** of this report.

2.3 Method of Hydrology and Hydraulic Analysis

The following storm drainage design criteria were used for all pipe systems:

1. Design storm rainfall data was used per NOAA'a National Weather Service Atlas 14, Volume 10, Version 2.

2. Infiltration system is designed for the 2, 10, 25, 50, AND 100-year storm events.

3. Piped storm drainage system and the outlets are designed for a 25-year storm event.

4. Minimum time of concentration = 5 minutes.

5. For rational peak flow calculations, runoff coefficients were as follows:

    a. Impervious (Pavement/Roof) areas = 0.90

    b. Wooded areas = 0.50

    c. Landscaped areas = 0.30

6. For hydrograph calculations, SCS Curve Numbers were as follows:

    a. Impervious (Pavement/Roof) areas = 98

    b. Pervious Soils = 69

7. Minimum diameter pipes, excluding roof leaders, underdrains and foundation drains = 10 inches

8. Minimum pipe slope = 0.50 percent

9. The storm water management Plan for the site is designed to treat the Water Quality Volume, remove 80% of Total Suspended Solids and reduce peak flow.

10. Watershed areas delineated using polylines in AutoCAD Civil 3D 2015.

11. Comparative hydrology analyzed using AutoCAD Civil 3D 2015 Hydraflow Hydrographs Extension Version 10.40 by Autodesk software.

12. Storm drainage system analyzed using AutoCAD Civil 3D 2015 Hydraflow Storm Sewers Extension Version 10.40 by Autodesk software.

Runoff computations and storm sewer calculations for existing and proposed conditions are included in the **Appendix C** for review.

2.4 Low Impact Development and Best Management Practices

The stormwater management plan for the proposed site has been designed to remove a high percentage of sediments in accordance with the Connecticut Department of Energy and Environmental Protection Stormwater Quality Manual.

The stormwater management plan for this site uses "Best Management Practices ("BMPs")" to meet or exceed the Connecticut DEEP's goal of 80% removal of total suspended solids and other pollutants as described in Section 2.5.

The BMPs include:

Area Drains with Sumps: Inlets with sumps serve to collect sediment and to prevent discharge of oil and other pollutants into the storm drainage system. All new catch basins will have 24-inch sumps.

Underground Infiltration: Underground infiltration serves as a secondary treatment practice and reduces peak flow rates. The infiltration system will utilize CONTECH CMP Infiltration system featuring three 24" perforated pipes enclosed in stone and filter fabric. Infiltration will also be utilized through a dry well on site.

2.5 Stormwater Maintenance and Inspection Schedule

The initial inspection will be made during an intense rainfall to check the adequacy of the yard drains, catch basins, roof leaders, piping, drainage swales, and infiltration systems.

The following is a checklist of items that will be checked and maintained during scheduled maintenance operations.

Drainage Structures: The Owner will be responsible for cleaning the catch basins, yard drains, manholes, piping, and swales on their property. A Connecticut licensed hauler shall clean the sumps, and legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed.

Each catch basin and yard drain shall be inspected every six months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Underground Infiltration: The underground infiltration system will be cleaned of all silt, debris and sediment from the inlet structure, outlet structure and the chamber lengths. The outlet control structure will be inspected and cleaned to make sure nothing is clogging the weir wall orifices or the discharge pipe.

Pavement: Paved areas shall be swept periodically by the Owner to clean trash and other debris. The Owner will sweep paved areas on its property in the spring to remove winter accumulations of road sand.

Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

A Maintenance and Inspection Plan, including forms and checklists, for the proposed project can be found in **Appendix D**.

Section 3
Site Utility Services

3.1 Sanitary Sewer

There is an existing 8" sanitary sewer located in East Lane. A sanitary sewer lateral will be installed from the proposed southern building and discharge westerly to this existing sanitary sewer. Similarly, a sanitary force main will be installed from the northern building and discharge to the existing sanitary sewer.

The on-site sanitary sewer system is sized adequately for the anticipated flow. Please refer to the calculations in **Appendix D**.

3.2 Water Supply

Water service is provided to the site by Aquarion Water Company, which reports an existing water main in East Lane. A new domestic water service from the existing main will be brought easterly to a proposed meter vault located in the property before connecting to the proposed buildings.

3.3 Electric and Tel-Data

Gas and electric service to the site will be provided by Eversource, and tel-data service will be provided by Cablevision and Frontier Communications. New overhead electric and tel-data services and required utility poles will be provided from and existing utility pole located in East Lane. Details related to these connections will be coordinated with the respective utility companies once more information about load requirements for the development have been established.

Section 4
Sedimentation and Erosion Control

4.1 Erosion Control Narrative

1. The proposed development is entitled "26 East Lane" in Darien, Connecticut.

2. Estimated:

    a. Project Start: Spring 2019

    b. Project Completion: Spring 2020

3. Erosion Control Narrative refers to drawings C4.0 and C4.1.

4. The proposed site development will consist of clearing and grubbing the existing site, excavation and rough grading of roadways, parking areas, sidewalks and curbing.

5. The development is located in Darien, Connecticut and is located on East Lane.

4.2 Erosion Control Notes

1. All sedimentation and erosion control measures shall be constructed in accordance with the standards and specifications of the "2002 Connecticut guidelines for soil erosion and sediment control", DEP Bulletin No. 34, and all amendments and addenda thereto as published by the Connecticut department of environmental protection.

2. Land disturbance shall be kept to the minimum necessary for construction operations.

3. All erosion control measures shall be installed as shown on the plan and elsewhere as ordered by the engineer or the town.

4. All catch basins shall be protected with a silt sacks, haybale ring, silt fence or block and stone inlet protection throughout the construction period and until all disturbed areas are thoroughly stabilized.

5. Whenever possible, erosion and sediment control measures shall be installed prior to construction. See "erosion control narrative".

6. Additional control measures shall be installed during the construction period as ordered by the engineer.

7. All sedimentation and erosion control measures shall be maintained in effective condition throughout the construction period.

8. Sediment removed shall be disposed of off-site or in a manner as required by the engineer.

9. The construction contractor shall be responsible for construction and maintenance of all control measures throughout the construction period.

10. All disturbed areas to be left exposed for more than 30 days shall be protected with a temporary vegetative cover. Seed these areas with perennial ryegrass at the rate of 40 lbs. per acre (1 lb. per 1,000 sq. ft). Apply soil amendments and mulch as required to establish a uniform stand of vegetation over all disturbed areas.

11. The construction contractor shall utilize approved methods/materials for preventing the blowing and movement of dust from exposed soil surfaces onto adjacent properties and site areas.

12. The construction contractor shall maintain a supply of silt fence/haybales and anti-tracking crushed stone on site for emergency repairs.

13. All drainage structures shall be periodically inspected weekly by the construction contractor and cleaned to prevent the build-up of silt.

14. The construction contractor shall carefully coordinate the placement of erosion control measures with the phasing of construction.

15. Keep all paved roadways clean. Sweep before forecasted storms.

16. Treat all unpaved surface with 4" minimum of topsoil prior to final stabilization.

17. Haybale barriers and silt fencing shall be installed along the toe of critical cut and fill slopes.

18. The contractor shall notify the town of Darien's environmental official prior to the installation of erosion controls, cutting of trees, or any excavation.

19. All trucks leaving the site must be covered.

20. Some control measures are permanent. These structures shall be cleaned and replenished at the end of construction. Locations of the permanent control structures are shown on the drainage plans.

21. All sedimentation and erosion controls shall be checked weekly and/or after each rain fall event. Necessary repairs shall be made without delay.

22. Prior to any forecasted rainfall, erosion and sediment controls shall be inspected and repaired as necessary.

23. After all disturbed areas have been stabilized, erosion controls may be removed once authorization to do so has been secured from the town. Disturbed areas shall be seeded and mulched.

4.3 Construction Sequence

1. Flag the limits of construction, right-of-way and tree protection zones.

2. Hold preconstruction meeting. (Remember to call before you dig 1-800-922-4455).

3. Hold tree cutting meeting.

4. Install the construction entrance.

5. Install perimeter erosion and sediment controls and tree protection devices in accordance with the SESC plan.

6. Cut trees within the defined clearing limits and remove cut wood. Chip brush and slash, stockpile chips for future use or remove off site.

7. Excavate all stumps located in the building footprint, parking areas and roadway and remove to a disposal site or stockpile area to be chipped. Remaining stumps shall be ground in place.

8. Strip all topsoil within the limits of the building footprint, parking areas, earth retention system and slope limits. Stockpile all topsoil in an approved area and secure with erosion and sediment controls.

9. Make all cuts and fills required. Establish the sub-grade for the topsoil areas, parking and roadway as required and bench the building to a subgrade. Allow a reasonable amount of area around the foot-print of the building for the construction activities.

10. Begin construction of the buildings.

11. Install all sanitary sewers and drainage facilities starting at the outfall and proceeding upgrade. Install remaining utilities (water, electric, cable, fiber optic, telephone). Ensure that the drainage outlet protection is in place prior to any flow being allowed to discharge.

12. Prior to installing surface water controls such as temporary diversions and stone dikes, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing water surface controls.

13. Prepare sub-base, slopes, parking areas, shoulder areas, and any other area of disturbance for final grading.

14. Install process aggregate in parking areas.

15. Place topsoil where required. Complete the perimeter landscape plantings.

16. Fine grade, rake, seed and mulch to within 2 feet of the curbing.

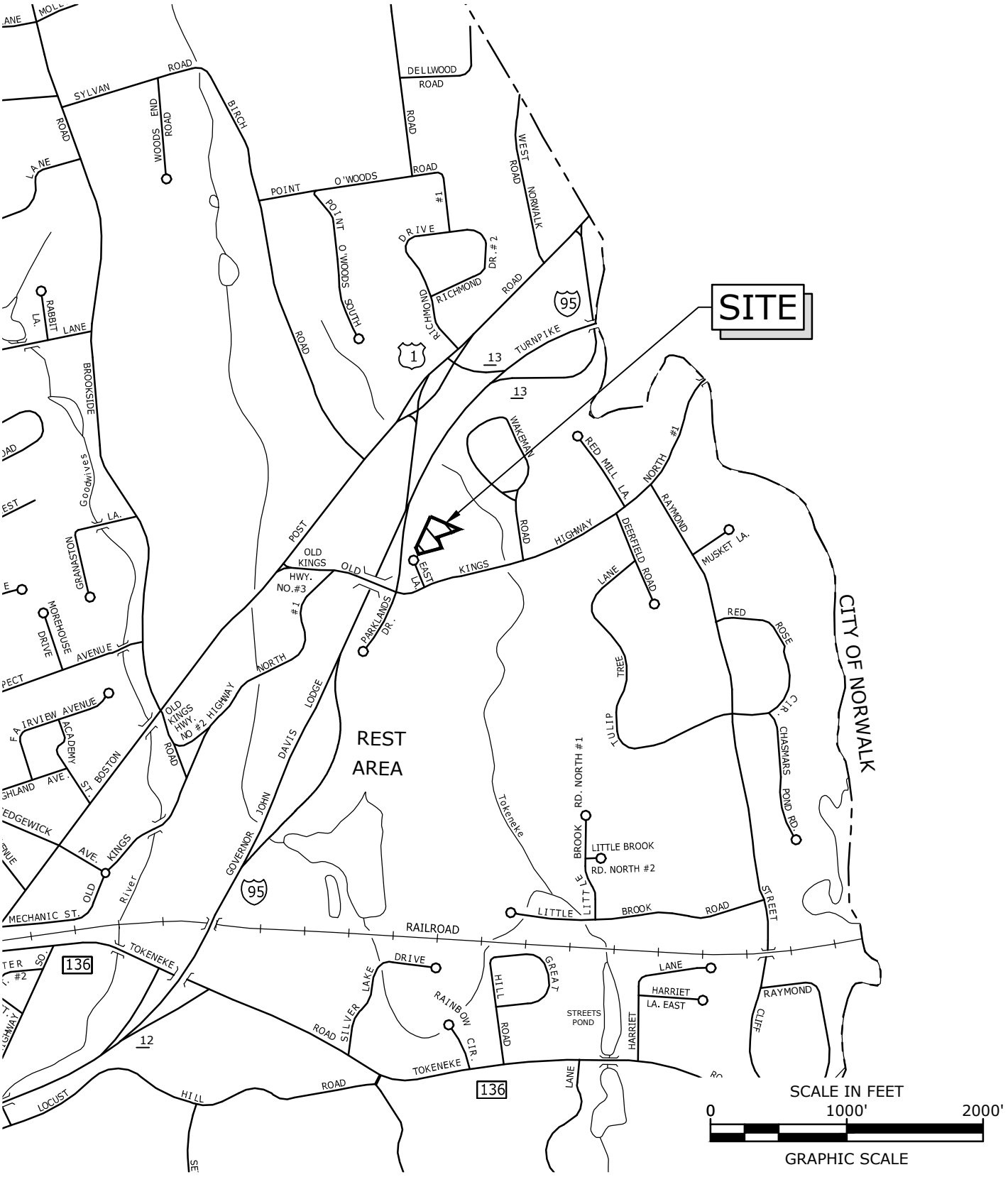
17. Upon substantial completion of the buildings, complete the balance of site work and stabilization of all other disturbed areas. Install first course of paving.

18. When all other work has been completed, repair and sweep all paved areas for the final course of paving. Inspect the drainage system and clean as needed.

19. Install final course of pavement for parking areas and roadway.

20. After site is stabilized remove temporary erosion and sediment controls (e.g. geotextile silt fences and haybales).

APPENDIX A



26 EAST LANE
DARIEN, CT

SITE LOCATION MAP

NORTH

1" = 1000'

FIGURE 1

Tighe&Bond
Engineers | Environmental Specialists

National Flood Hazard Layer FIRMette

FEMA

41°5'19.22"N

73°27'50.37"W

73°27'12.91"W

41°4'52.10"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **5/9/2018 at 7:27:36 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective data. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

N

26 EAST LANE
DARIEN, CT

FEMA FIRM

DATE: 05/17/2018
SCALE: AS NOTED
FIGURE 2

Tighe&Bond
Engineers | Environmental Specialists

APPENDIX B

Drainage Class—State of Connecticut
(26 East Lane Darien, CT)

Map Scale: 1:2,250 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 16, Sep 15, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	Well drained	7.6	63.2%
108	Saco silt loam	Very poorly drained	3.5	29.4%
306	Udorthents-Urban land complex	Well drained	0.9	7.3%
307	Urban land		0.0	0.1%
Totals for Area of Interest			**12.0**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

PFIZER – JÄHNIG
ENVIRONMENTAL CONSULTING

May 17, 2018

Wetland Delineation Report
Adjacent lands northwest and northeast of
26 East Lane
Darien, Connecticut

Properties to the north and northwest of 26 East Lane were investigated on May 11, 2018 by Mary Jaehnig, soil scientist. The property northwest of the site is an upland adjacent to the steep slopes ascending to I-95. The property northeast of the site is a residential lot.

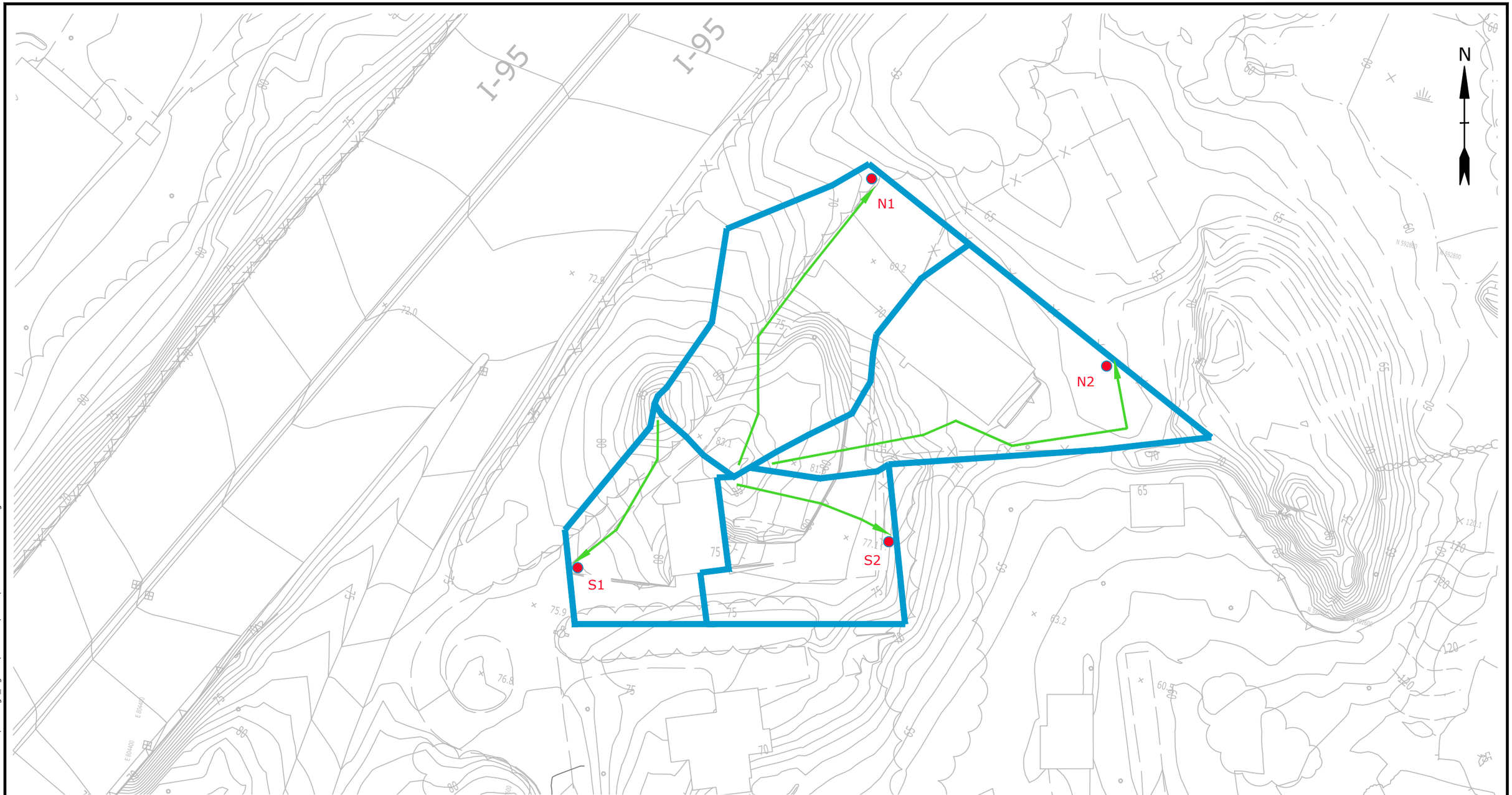
Soil samples were obtained using a spade and auger. Features noted include color, texture and depth to hydric indicators. Soils were classified according to guidelines established by the USDA NRCS. A wetland/watercourse area was flagged northeast of the property with chronologically labeled ribbon numbered 1 thru 8.

Flow from a pipe beneath I-95 emerges off site of 26 East Lane and flows to the northeast along a swale parallel to the thruway. The wetland continues onto the residential lot northeast of 26 East Lane. The wetland soil is Saco silt loam. The upland soil is Charlton fine sandy loam.

Submitted by,
Mary Jaehnig
Mary Jaehnig
certified soil scientist

17 FAIRVIEW AVE. RIDGEFIELD, CT 06877 TEL. (203) 431-8113
MaryJaehnigSoils@gmail.com

APPENDIX C



LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION PATH

DESIGN POINT S1

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

26 EAST LANE
DARIEN, CT

EXISTING WATERSHED MAP

DATE: 05/07/2018
SCALE: AS NOTED
FIGURE WM-01

Tighe&Bond
Engineers | Environmental Specialists

May 08, 2018-3:05pm Plotted By: JCB1
Tighe & Bond, Inc. J:\B\B0509 Baywaten\007 - 26 East Lane\Drawings_Figures\AutoCAD\Sheet\B0509-07-EX-WS.dwg

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B 0507**
Project Location: **Darien, CT**
Description: **Meadow Condition CN & Tc Calculations**
Prepared By: **jcb** Date: **May 7 2018**

Designation: **N1**
Location: North Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded	0.000	80	0.0000
Meadow	0.320	69	22.0800
	0.320		22.0800

Weighted CN: 69

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	105	0.25	5.3

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment D - E	unpaved	0.08	4.56	59	0.2

Total Tc = 5.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **N2**
Location: Northeast Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded	0.000	80	0.0000
Meadow	0.313	69	21.5970
	0.313		21.5970

Weighted CN: 69

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	37	0.08	3.6
Segment B - C	0.24	13	0.02	2.7
Segment C - D	0.24	81	0.11	6.0

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment D - E	unpaved	0.01	1.61	91	0.9

Total Tc = 13.3 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Consulting Engineers
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Project Name: **26 East Lane**
Project Number: **B 0507**
Project Location: **Darien, CT**
Description: **Meadow Condition CN & Tc Calculations**
Prepared By: **jcb** Date: **May 7 2018**

Designation: **S1**
Location: South Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded	0.000	80	0.0000
Meadow	0.158	69	10.9020
	0.158		10.9020

Weighted CN: 69

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	21	0.23	1.5
Segment A - B	0.24	31	0.05	3.8

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment C - D	unpaved	0.06	3.95	32	0.1

Total Tc = 5.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **S2**
Location: South Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded	0.000	80	0.0000
Meadow	0.176	69	12.1440
	0.176		12.1440

Weighted CN: 69

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	81	0.11	6.0

Total Tc = 6.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Watershed Model Schematic

1 - N1

2 - N2

3 - S1

4 - S2

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.325	-------	-------	0.807	1.144	1.413	1.687	N1
2	SCS Runoff	------	-------	0.273	-------	-------	0.673	0.955	1.183	1.416	N2
3	SCS Runoff	------	-------	0.161	-------	-------	0.398	0.565	0.698	0.833	S1
4	SCS Runoff	------	-------	0.289	-------	-------	0.671	0.934	1.149	1.368	S2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

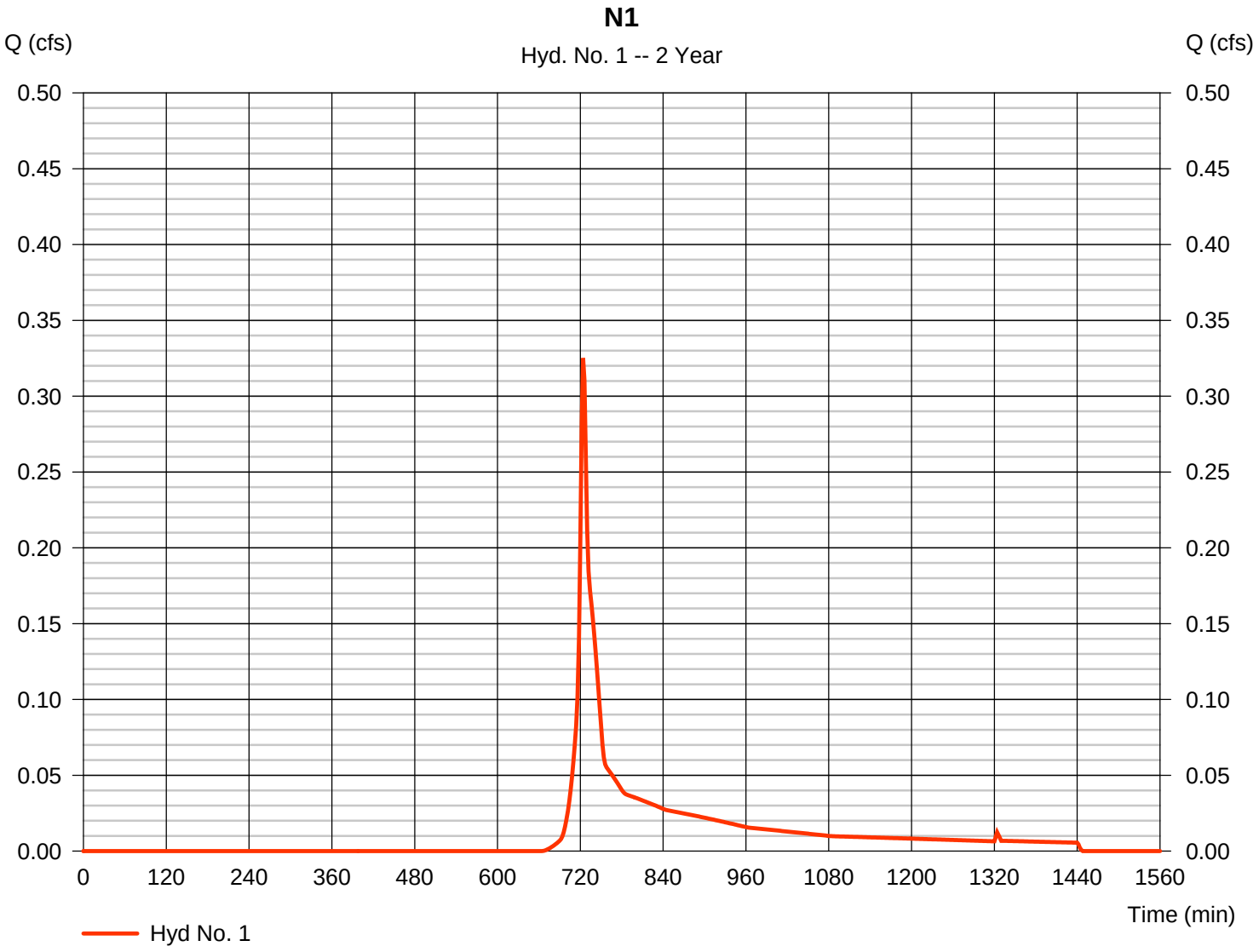
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.325	2	724	1,065	------	------	------	N1
2	SCS Runoff	0.273	2	730	1,146	------	------	------	N2
3	SCS Runoff	0.161	2	724	526	------	------	------	S1
4	SCS Runoff	0.289	2	718	586	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.325 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,065 cuft
Drainage area	=	0.320 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

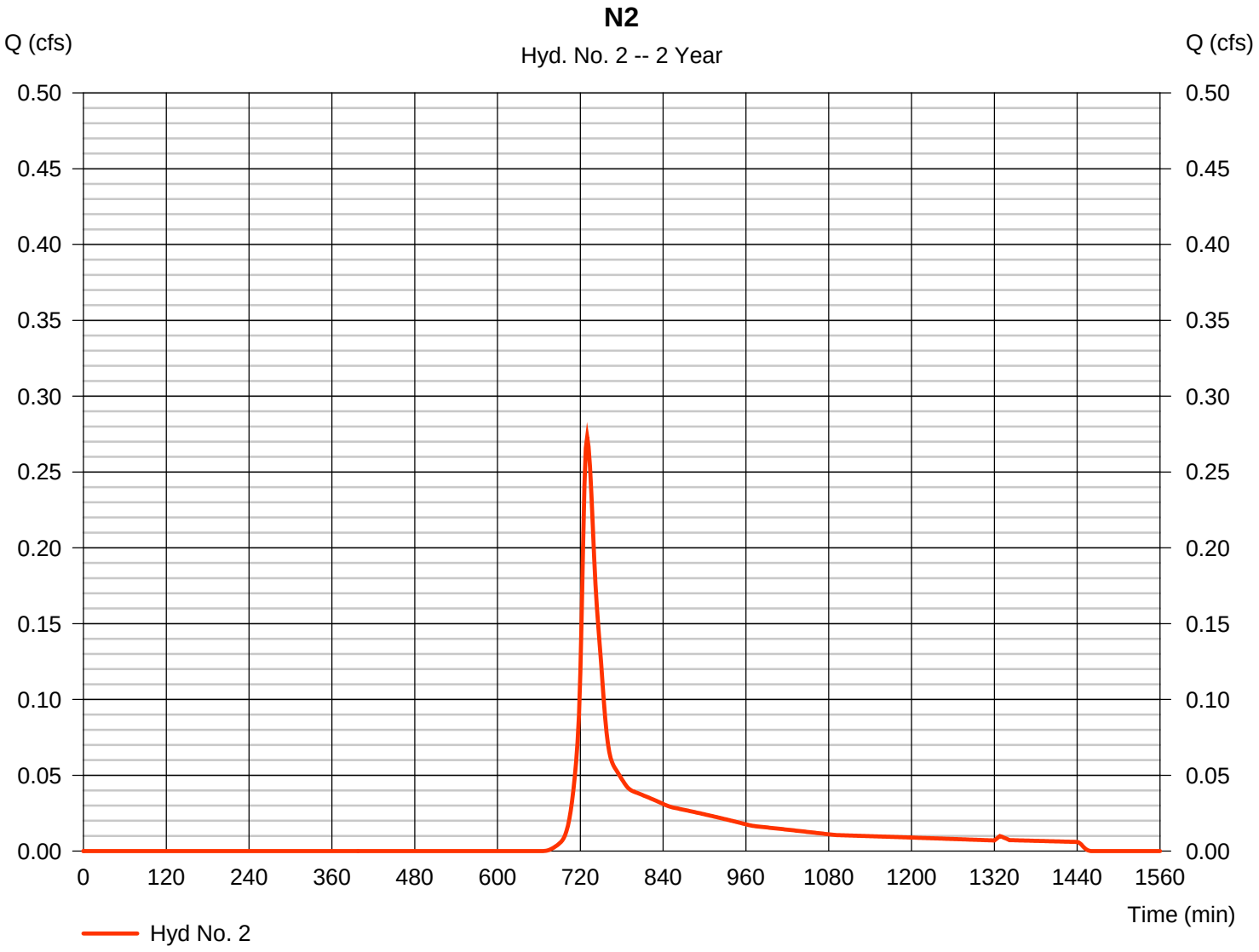


Hydrograph Report

Hyd. No. 2

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.273 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	1,146 cuft
Drainage area	=	0.313 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	13.30 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

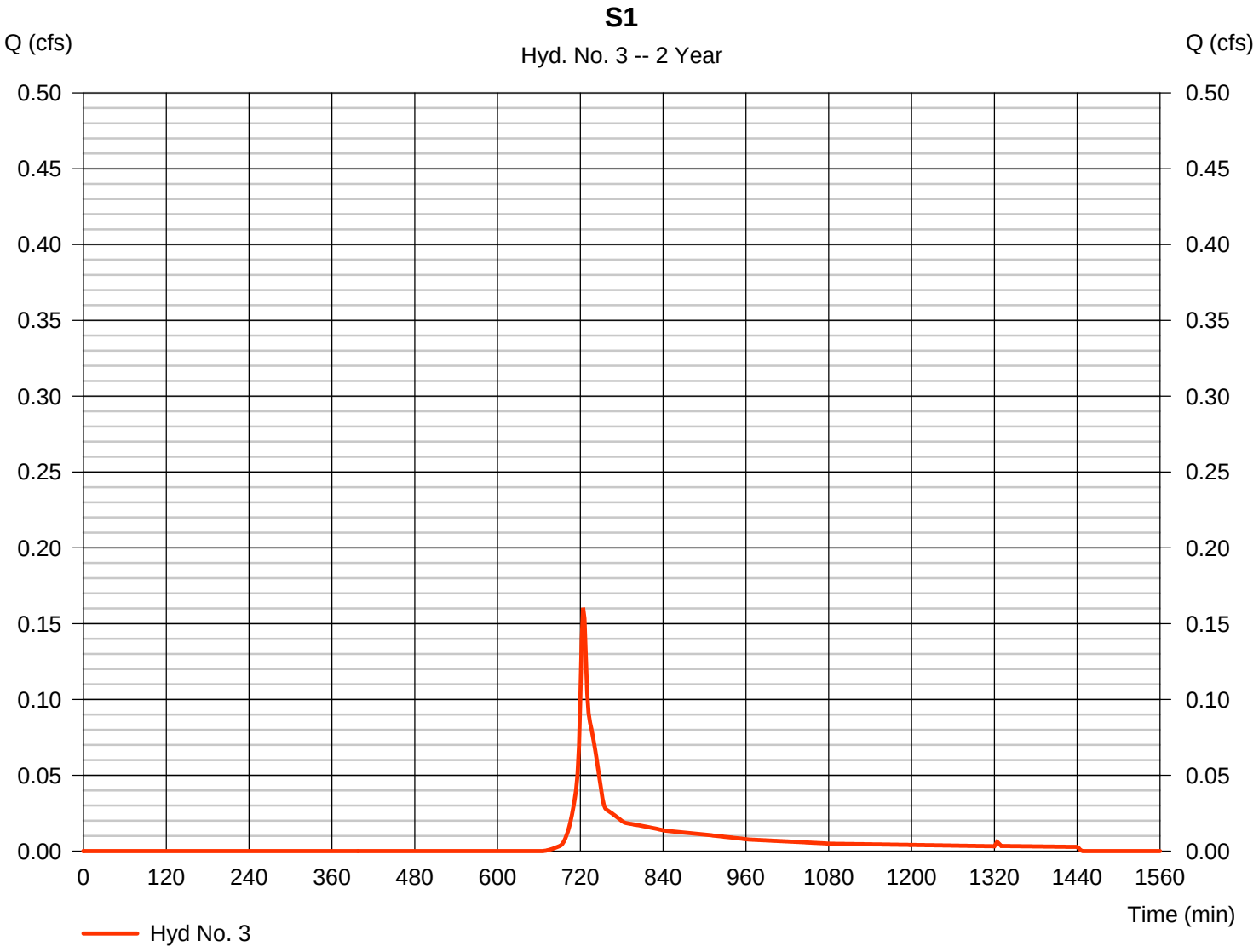


Hydrograph Report

Hyd. No. 3

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.161 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	526 cuft
Drainage area	=	0.158 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

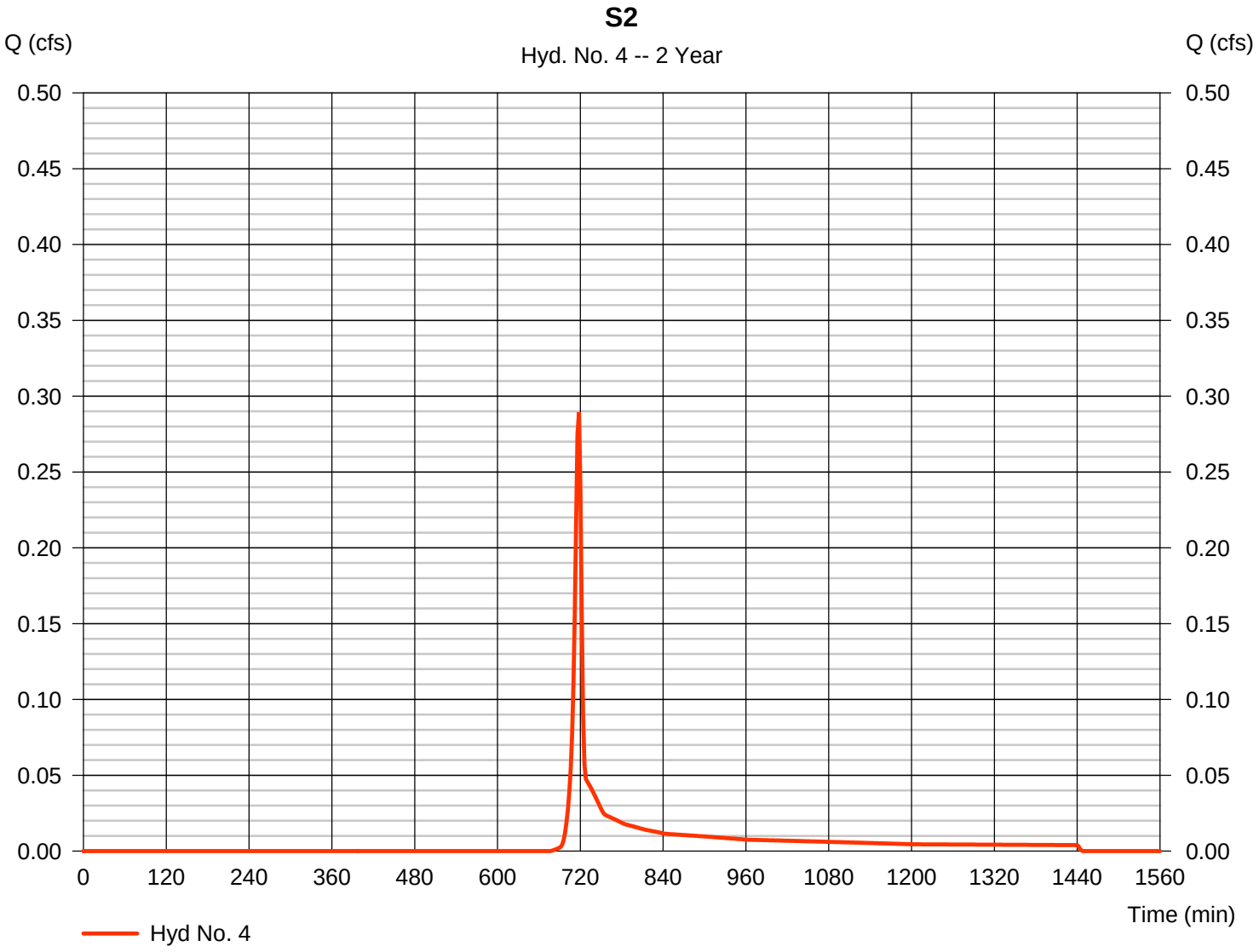


Hydrograph Report

Hyd. No. 4

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.289 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	586 cuft
Drainage area	=	0.176 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.54 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

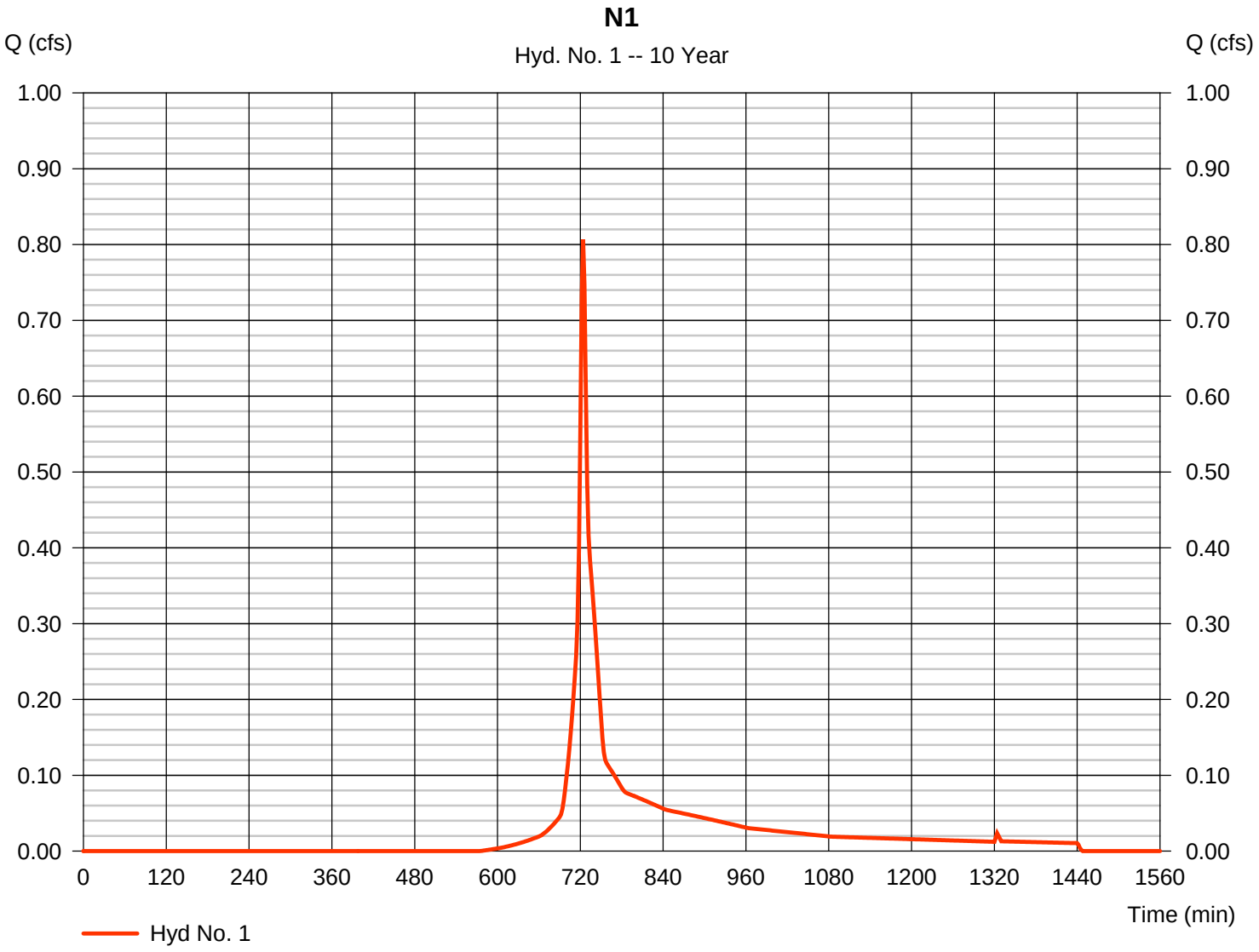
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.807	2	724	2,445	------	------	------	N1
2	SCS Runoff	0.673	2	730	2,631	------	------	------	N2
3	SCS Runoff	0.398	2	724	1,207	------	------	------	S1
4	SCS Runoff	0.671	2	718	1,345	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.807 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,445 cuft
Drainage area	=	0.320 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

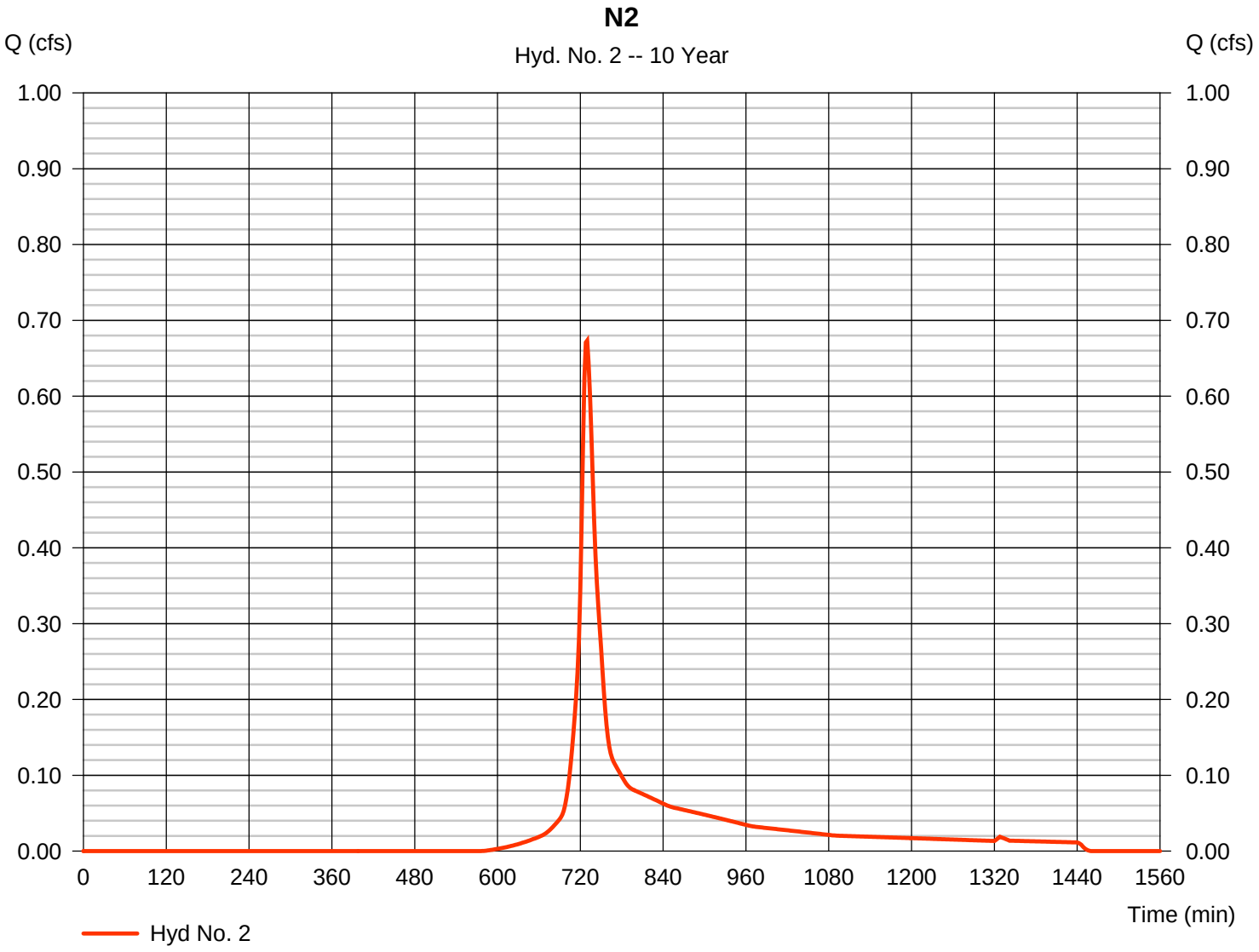


Hydrograph Report

Hyd. No. 2

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.673 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	2,631 cuft
Drainage area	=	0.313 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	13.30 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

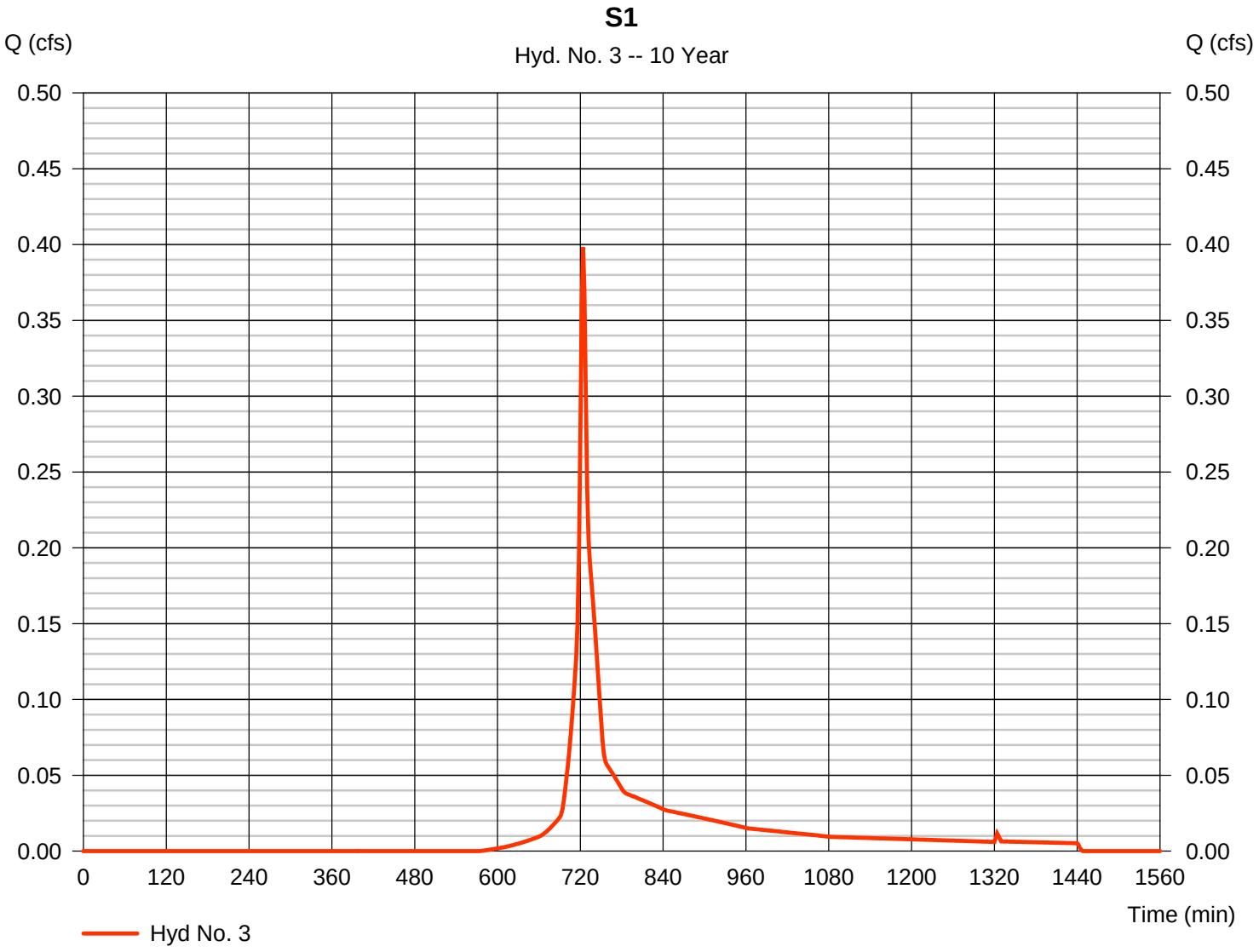


Hydrograph Report

Hyd. No. 3

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.398 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,207 cuft
Drainage area	=	0.158 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

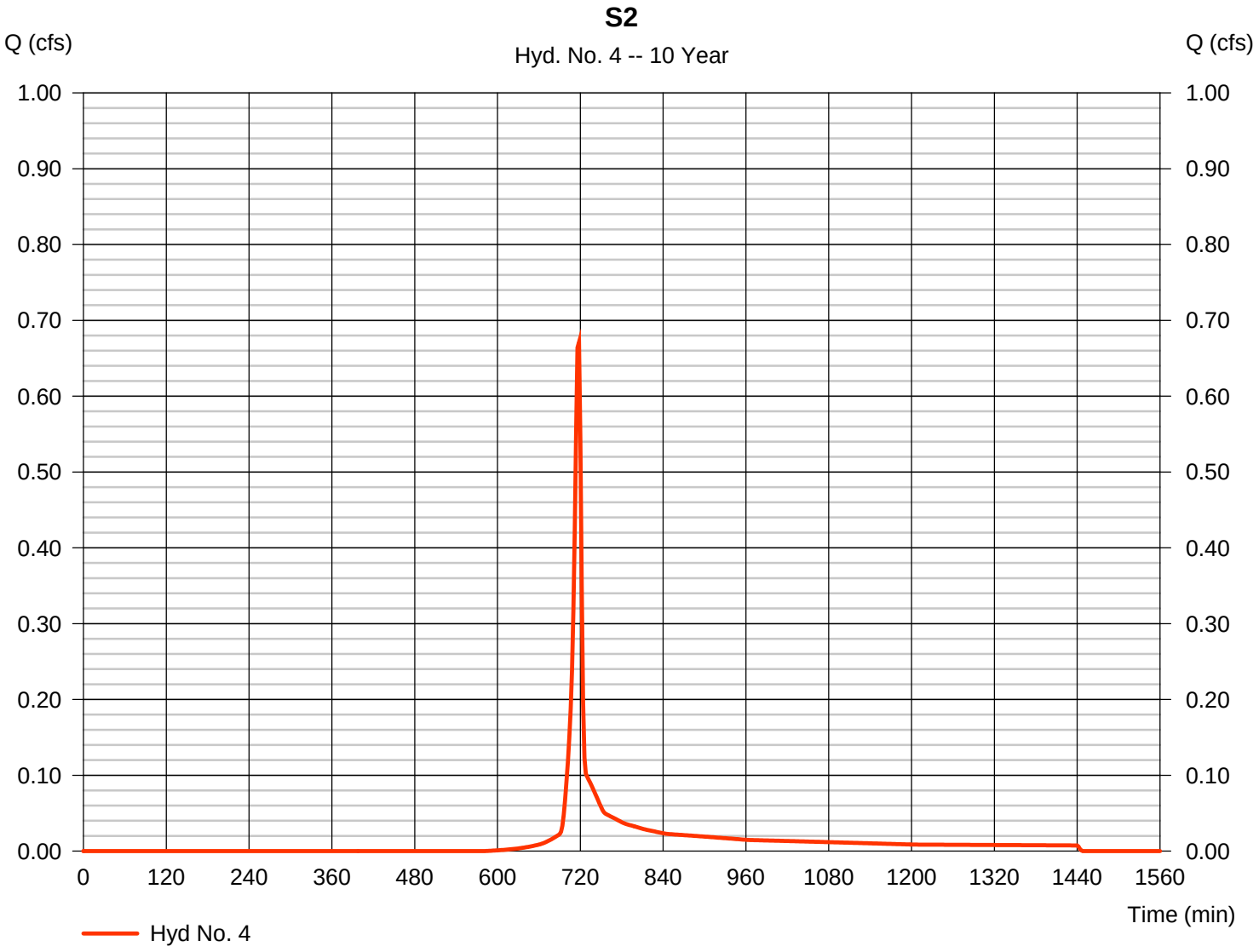


Hydrograph Report

Hyd. No. 4

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.671 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	1,345 cuft
Drainage area	=	0.176 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.39 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

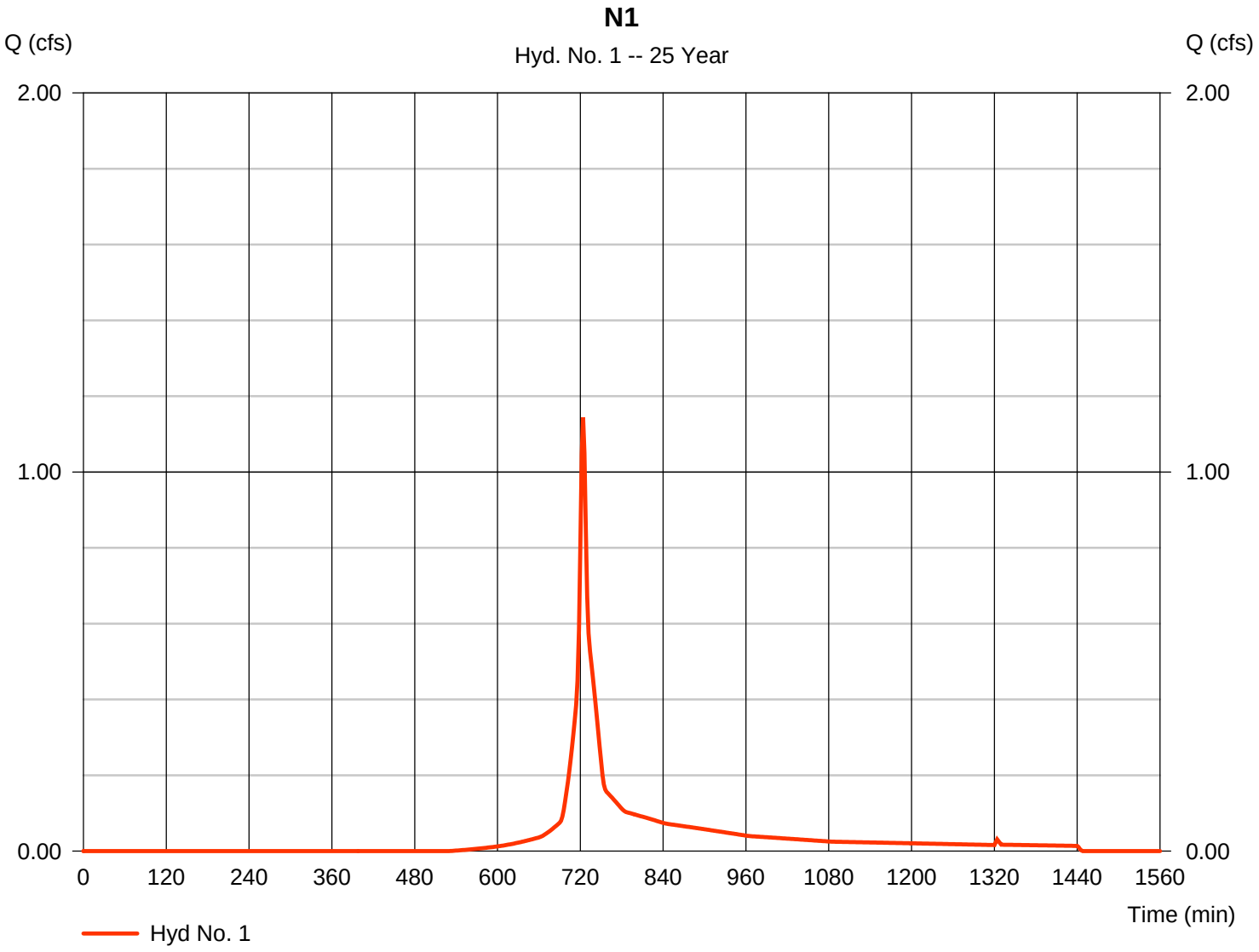
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.144	2	724	3,429	------	------	------	N1
2	SCS Runoff	0.955	2	728	3,689	------	------	------	N2
3	SCS Runoff	0.565	2	724	1,693	------	------	------	S1
4	SCS Runoff	0.934	2	716	1,886	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.144 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	3,429 cuft
Drainage area	=	0.320 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

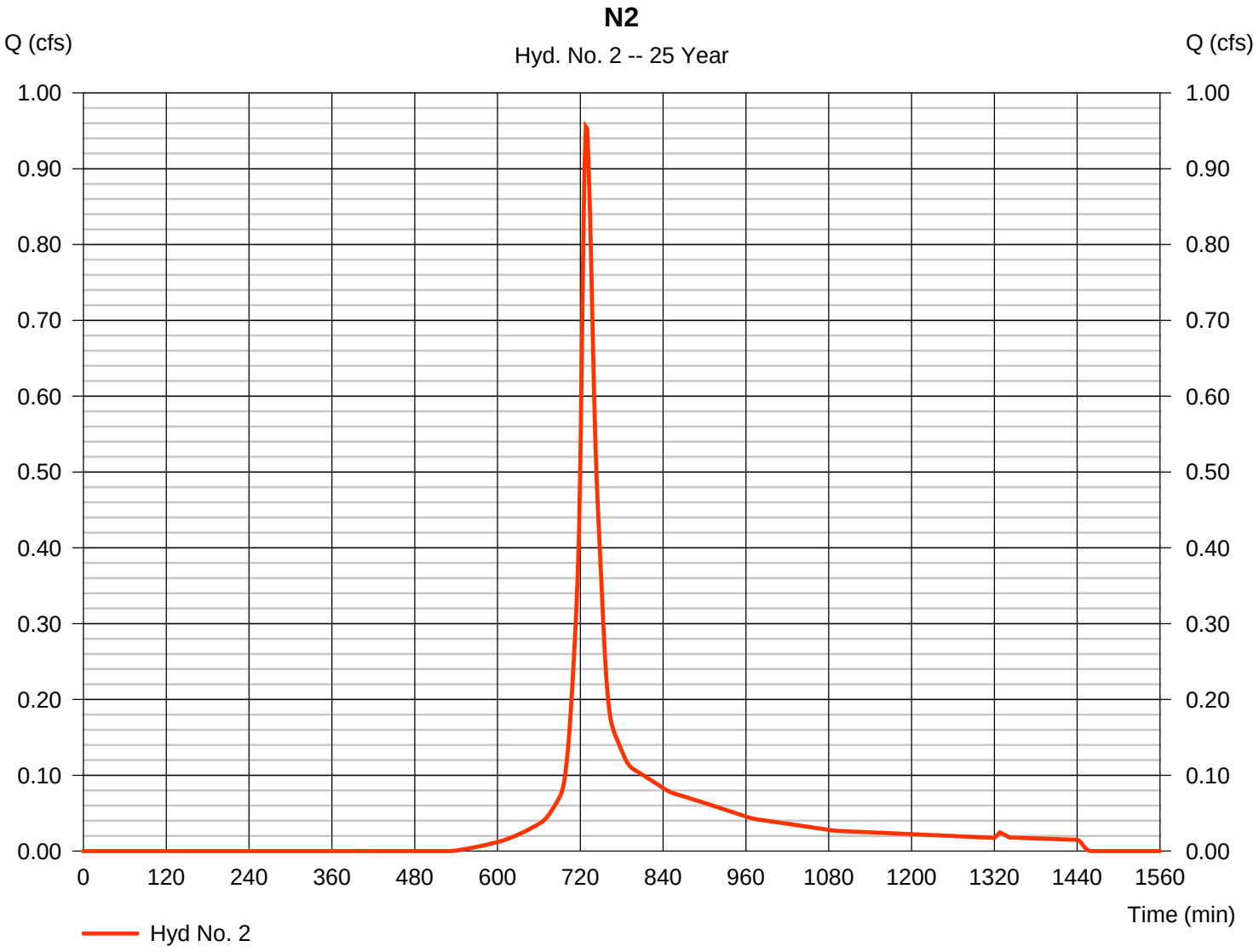


Hydrograph Report

Hyd. No. 2

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.955 cfs
Storm frequency	=	25 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	3,689 cuft
Drainage area	=	0.313 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	13.30 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

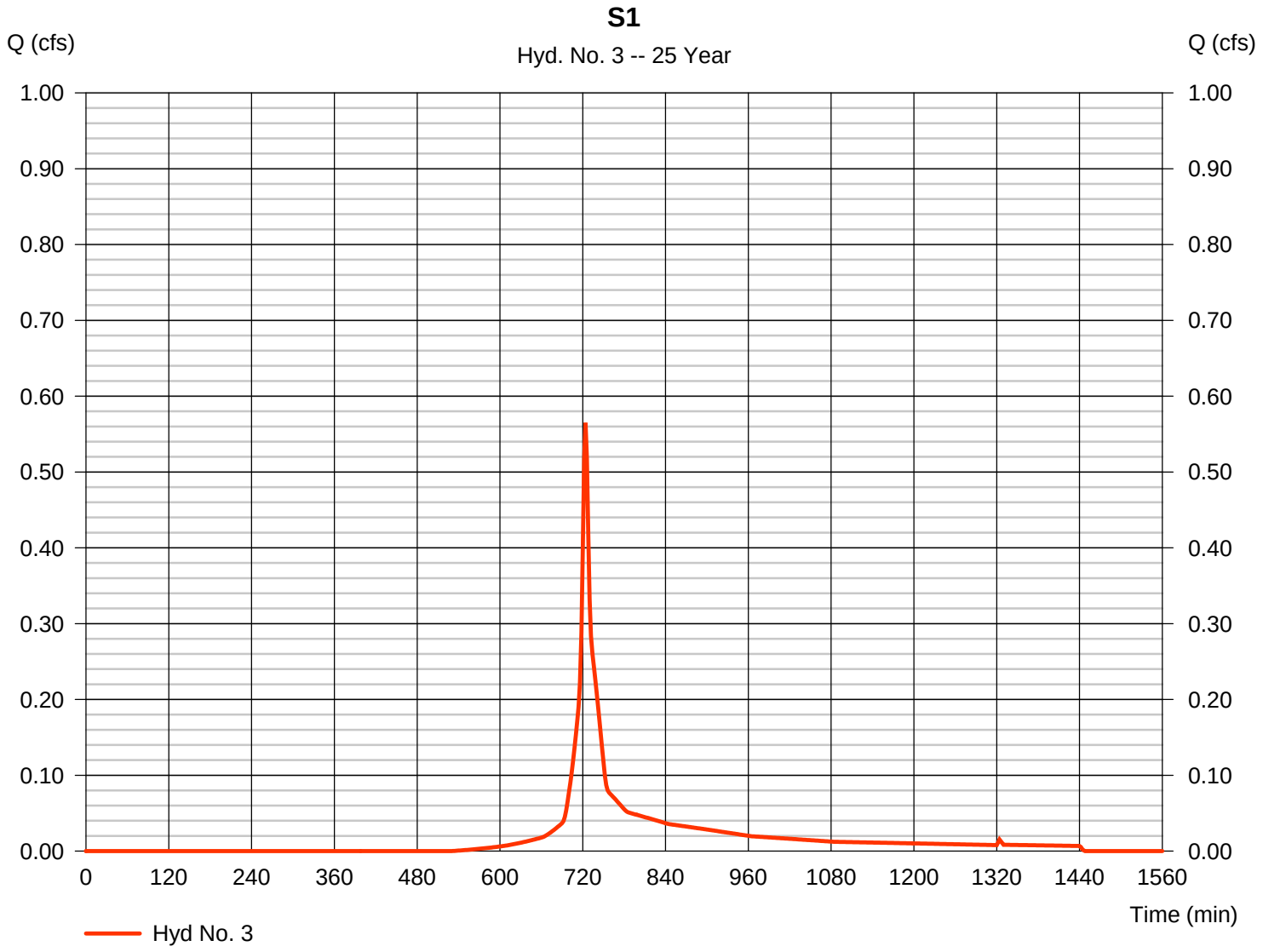


Hydrograph Report

Hyd. No. 3

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.565 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,693 cuft
Drainage area	=	0.158 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

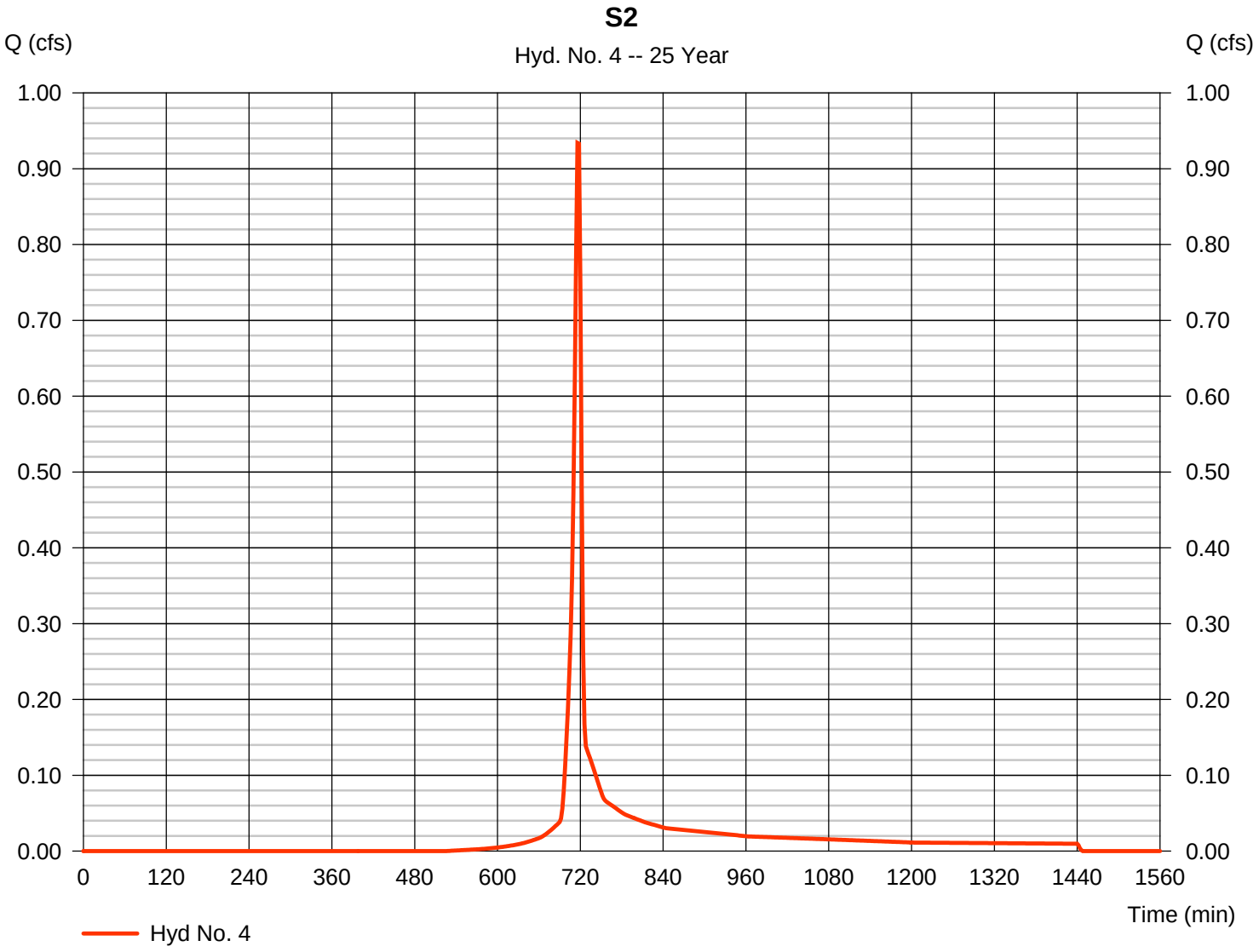


Hydrograph Report

Hyd. No. 4

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.934 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,886 cuft
Drainage area	=	0.176 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	6.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

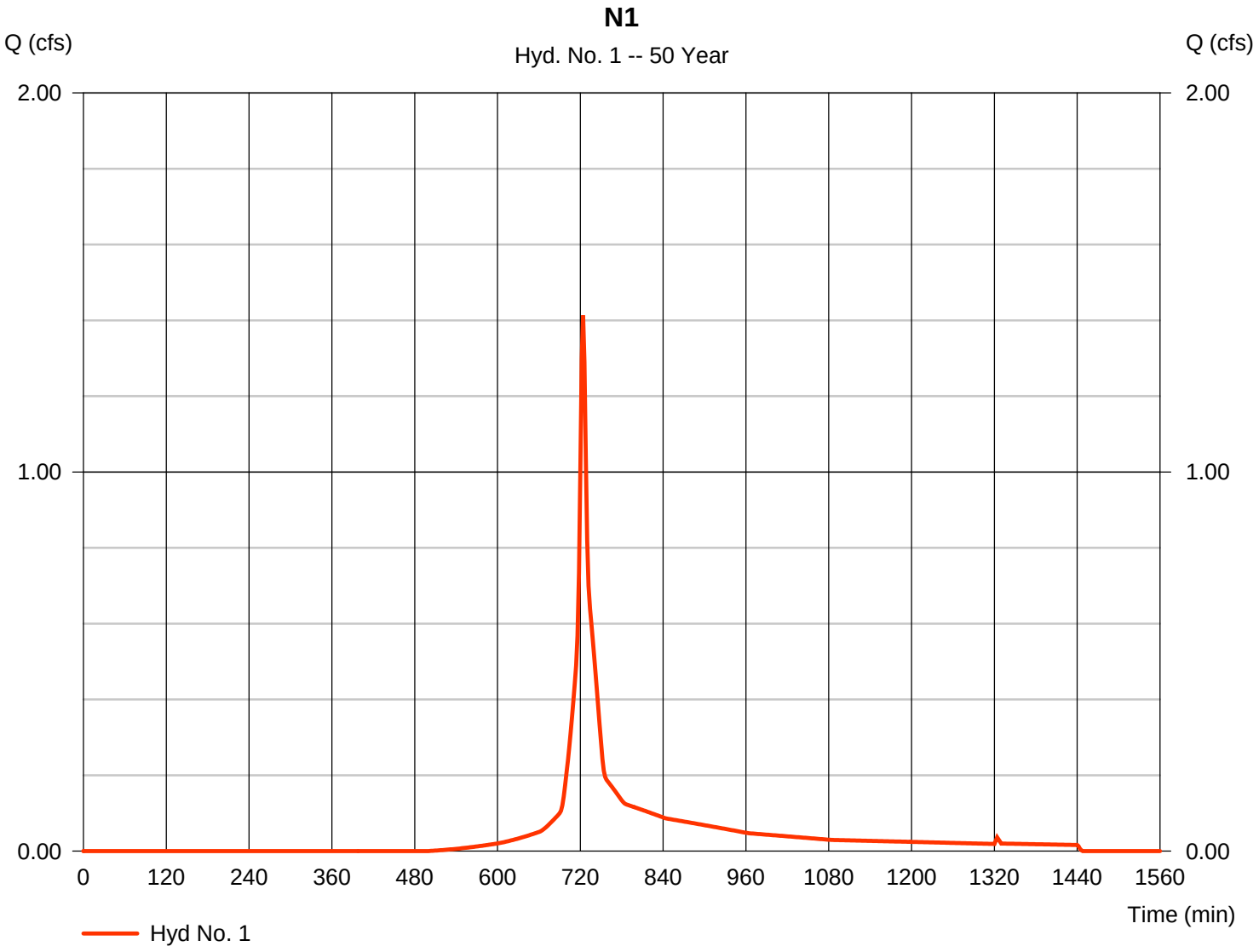
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.413	2	724	4,223	------	------	------	N1
2	SCS Runoff	1.183	2	728	4,544	------	------	------	N2
3	SCS Runoff	0.698	2	724	2,085	------	------	------	S1
4	SCS Runoff	1.149	2	716	2,323	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.413 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	4,223 cuft
Drainage area	=	0.320 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

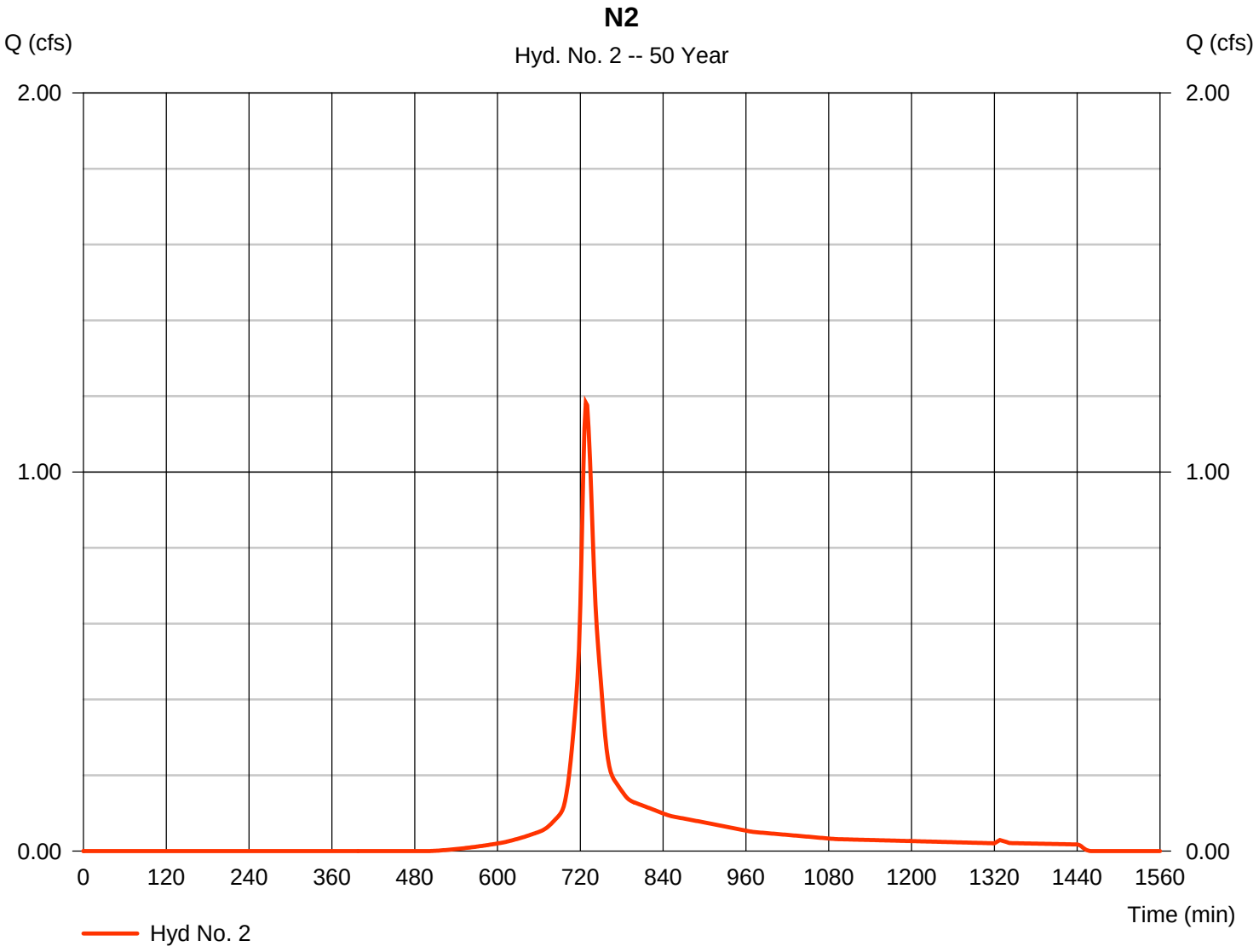


Hydrograph Report

Hyd. No. 2

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.183 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	4,544 cuft
Drainage area	=	0.313 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	13.30 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

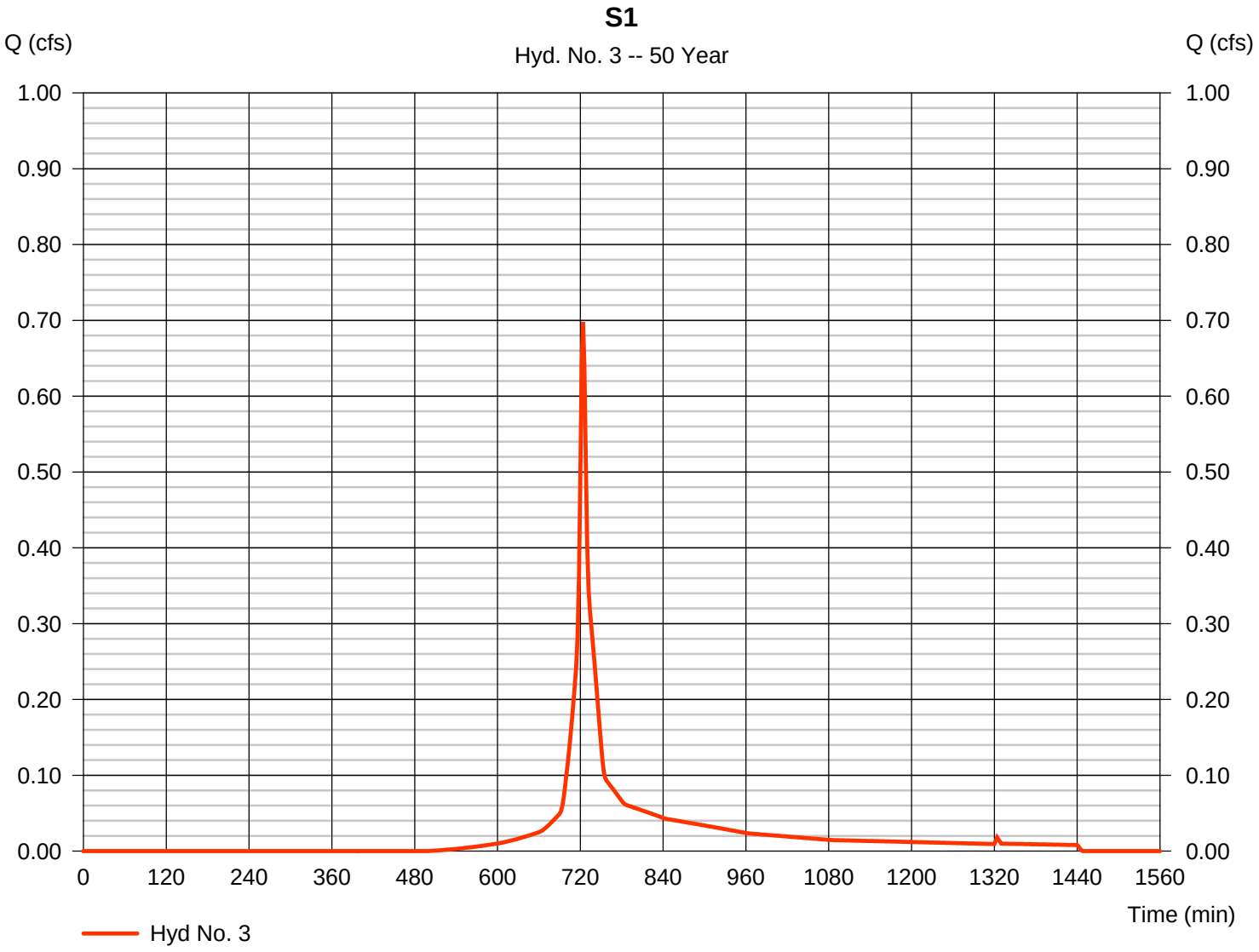


Hydrograph Report

Hyd. No. 3

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.698 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,085 cuft
Drainage area	=	0.158 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

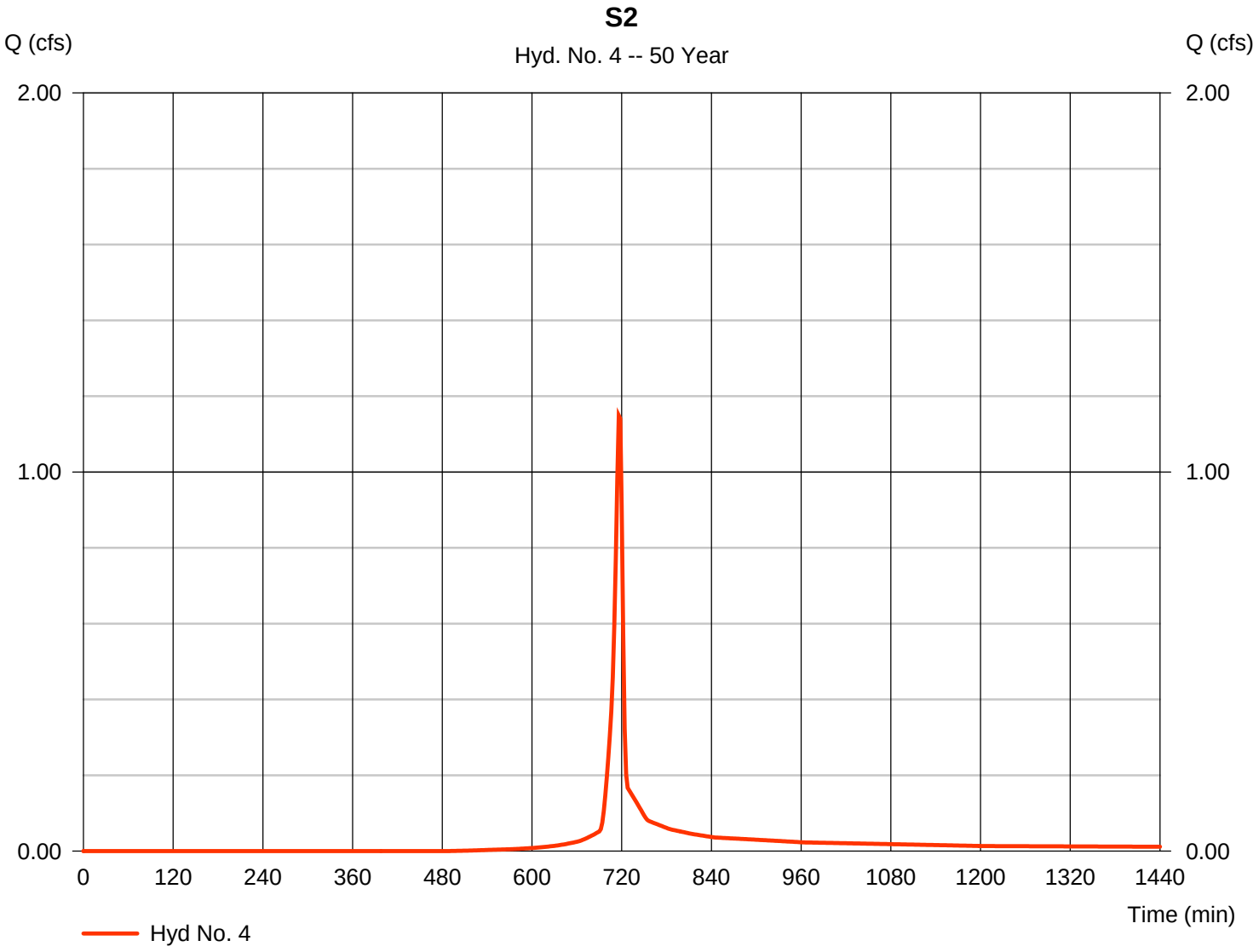


Hydrograph Report

Hyd. No. 4

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.149 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,323 cuft
Drainage area	=	0.176 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.44 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

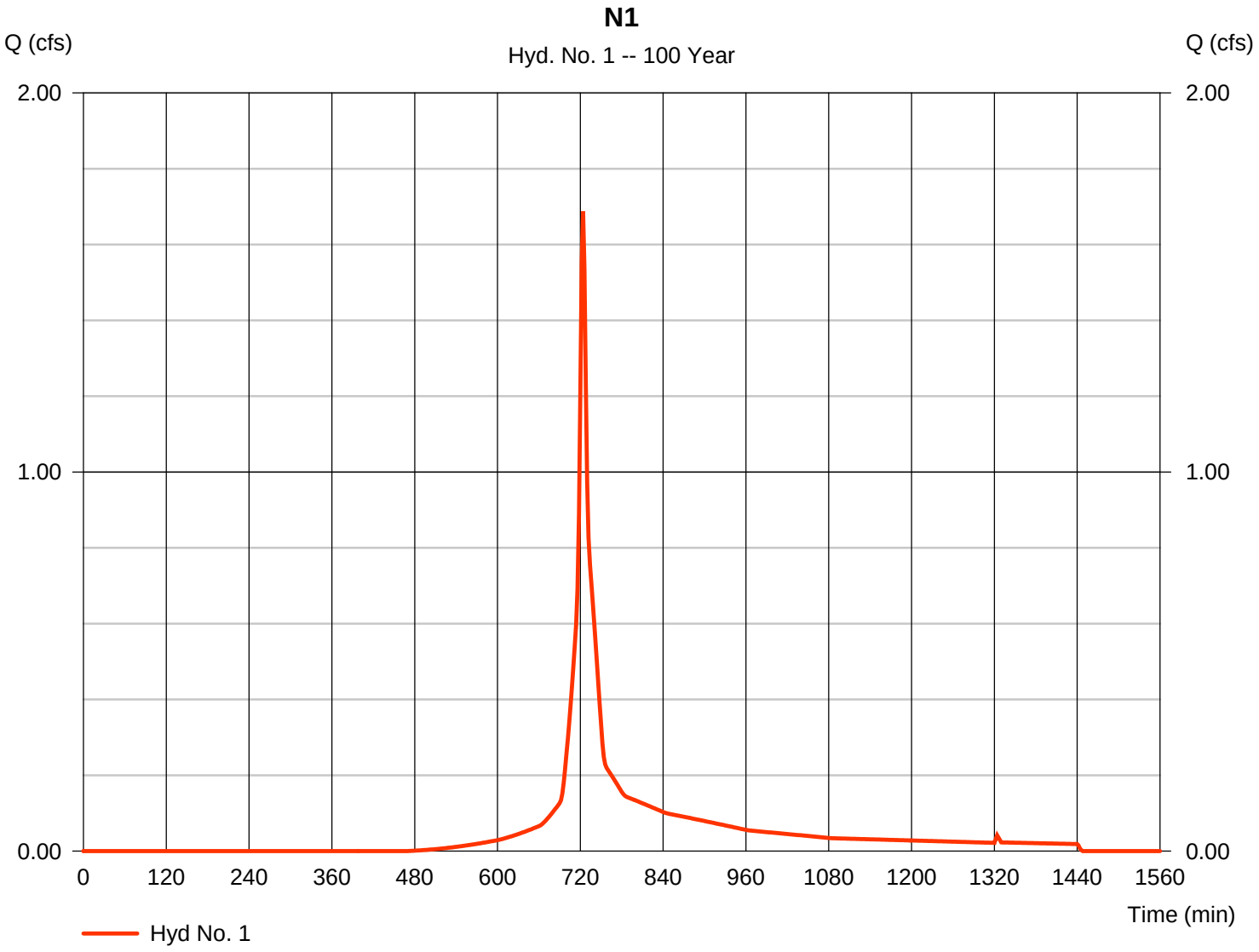
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.687	2	724	5,044	------	------	------	N1
2	SCS Runoff	1.416	2	728	5,427	------	------	------	N2
3	SCS Runoff	0.833	2	724	2,490	------	------	------	S1
4	SCS Runoff	1.368	2	716	2,774	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.687 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	5,044 cuft
Drainage area	=	0.320 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

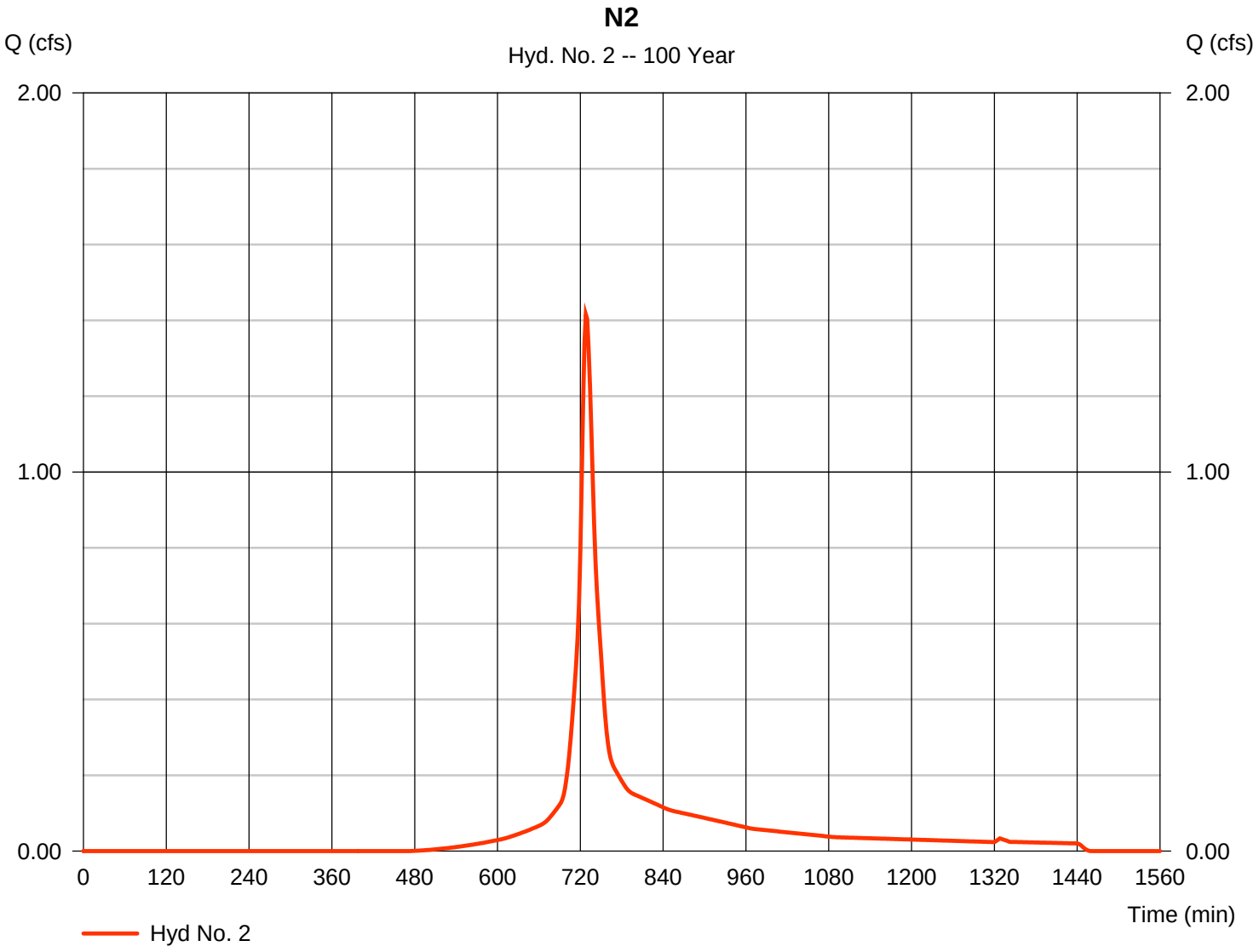


Hydrograph Report

Hyd. No. 2

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.416 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	5,427 cuft
Drainage area	=	0.313 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	13.30 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

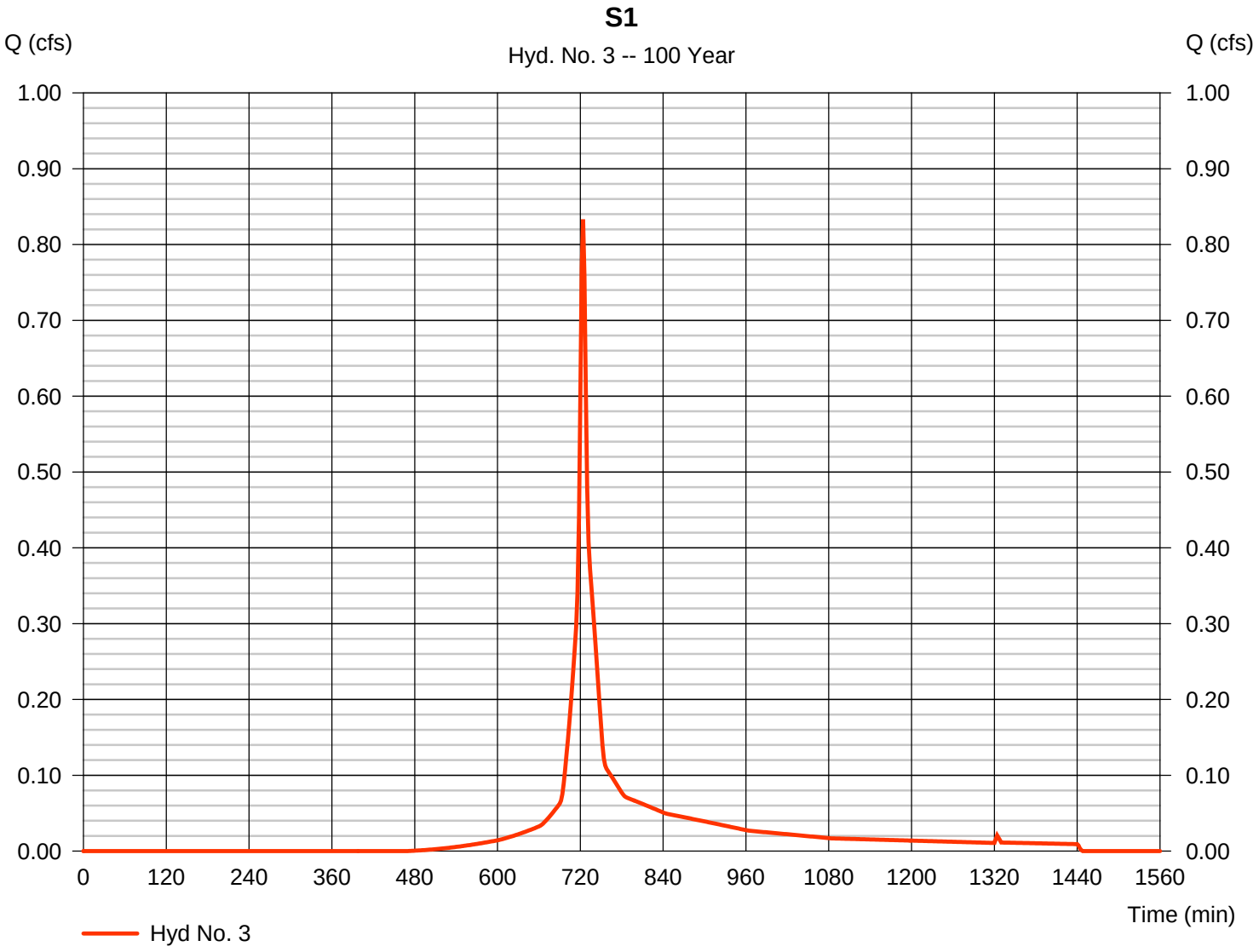


Hydrograph Report

Hyd. No. 3

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.833 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,490 cuft
Drainage area	=	0.158 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.50 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

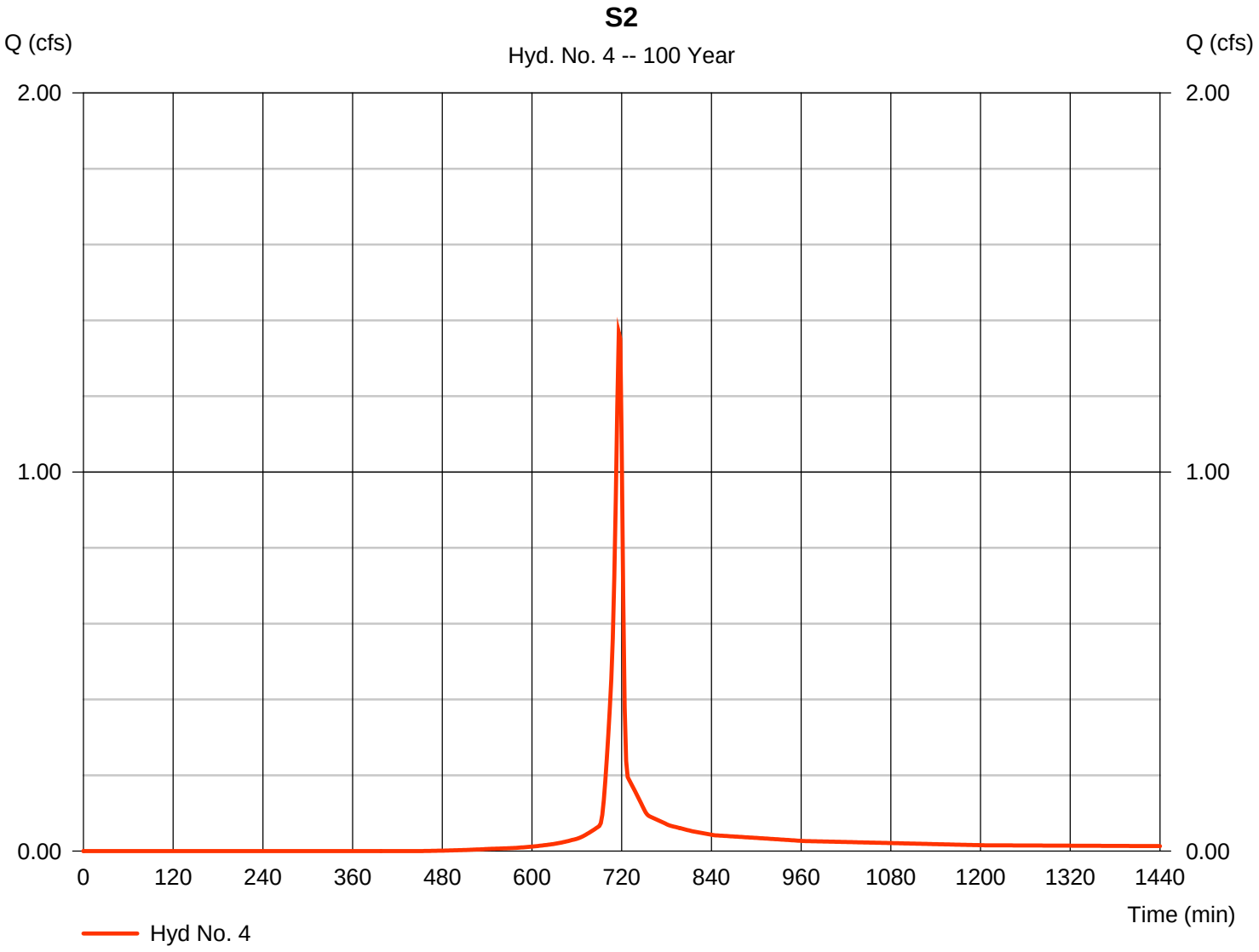


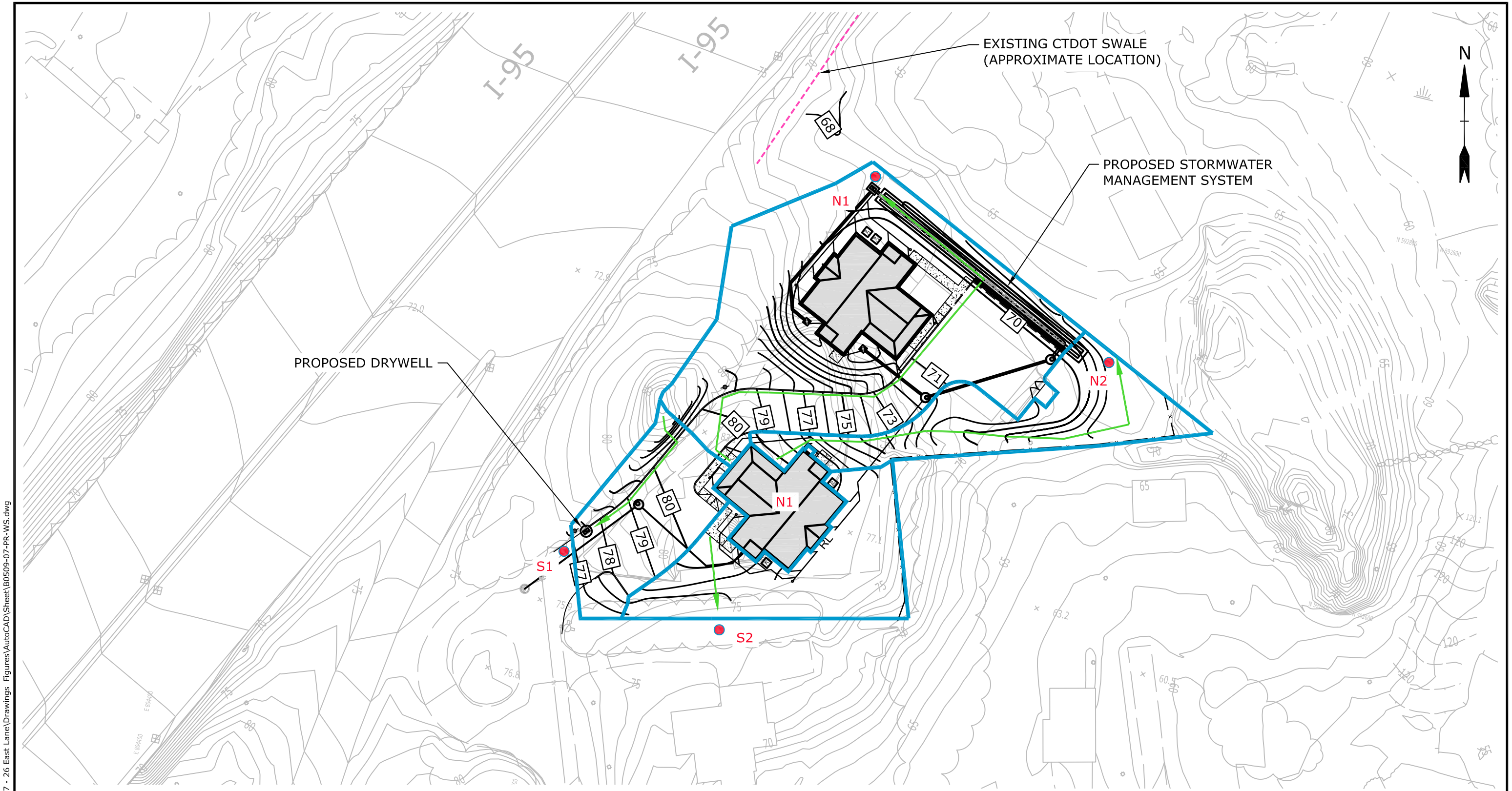
Hydrograph Report

Hyd. No. 4

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.368 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,774 cuft
Drainage area	=	0.176 ac	Curve number	=	69
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.33 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484





LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION PATH

DESIGN POINT S2

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

26 EAST LANE
DARIEN, CT

PROPOSED WATERSHED MAP

DATE: 05/07/2018
SCALE: AS NOTED
FIGURE WM-01

Tighe&Bond
Engineers | Environmental Specialists

May 17, 2018-2:27pm Plotted By: JCB1
Tighe & Bond, Inc. J:\B\B0509 Baywater\007 - 26 East Lane\Drawings_Figures\AutoCAD\Sheet\B0509-07-PR-WS.dwg

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B 0507**
Project Location: **Darien, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **jcb** Date: **May 7 2018**

Designation: **N1**
Location: North Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.282	98	27.6360
Wooded - B Soil Group	0.097	68	6.5960
Landscaped and Lawns - B Soil Group	0.160	68	10.8800
	0.539		45.1120

Weighted CN: 84

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland					
Segment		**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B		0.015	150	0.05	1.5
Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	paved	0.01	2.03	30	0.2
Segment C - D	UNPAVED	0.01	1.61	75	0.8

Total Tc = 2.5
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **N2**
Location: North East Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded - B Soil Group	0.000	68	0.0000
Landscaped and Lawns - B Soil Group	0.151	68	10.2680
	0.151		10.2680

Weighted CN: 68

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	150	0.15	8.7

Shallow Concentrated Flow					
Segment		**Slope (ft/ft)**	**V (ft/s)**	**Length (ft)**	**Time (min.)**
Segment B - C	unpaved	0.06	3.95	43	0.2

Total Tc = 8.9 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B 0507**
Project Location: **Darien, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **jcb** Date: **May 7 2018**

Designation: **S1**
Location: South Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.083	98	8.1340
Wooded - B Soil Group	0.000	68	0.0000
Landscaped and Lawns - B Soil Group	0.038	68	2.5840
	0.121		10.7180

Weighted CN: 89

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	17	0.23	1.3
Segment B - C	0.015	74	0.05	0.8

Total Tc = 2.1 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **S2**
Location: South Site

Cover Type	Area, ac	CN	A x CN
Pavement	0.000	98	0.0000
Wooded - B Soil Group	0.000	68	0.0000
Landscaped and Lawns - B Soil Group	0.156	68	10.6080
	0.156		10.6080

Weighted CN: 68

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	40	0.08	3.9

Total Tc = 3.9 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Watershed Model Schematic

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	1.209	-------	-------	2.199	2.826	3.306	3.785	N1
2	Reservoir	1	-------	0.000	-------	-------	0.000	0.260	0.934	1.531	N1 Infiltration Swale
3	SCS Runoff	------	-------	0.132	-------	-------	0.337	0.483	0.600	0.720	N2
4	SCS Runoff	------	-------	0.325	-------	-------	0.550	0.689	0.796	0.901	S1
5	Reservoir	4	-------	0.138	-------	-------	0.391	0.512	0.601	0.689	S1 Dry Well
6	SCS Runoff	------	-------	0.146	-------	-------	0.375	0.536	0.665	0.797	S2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

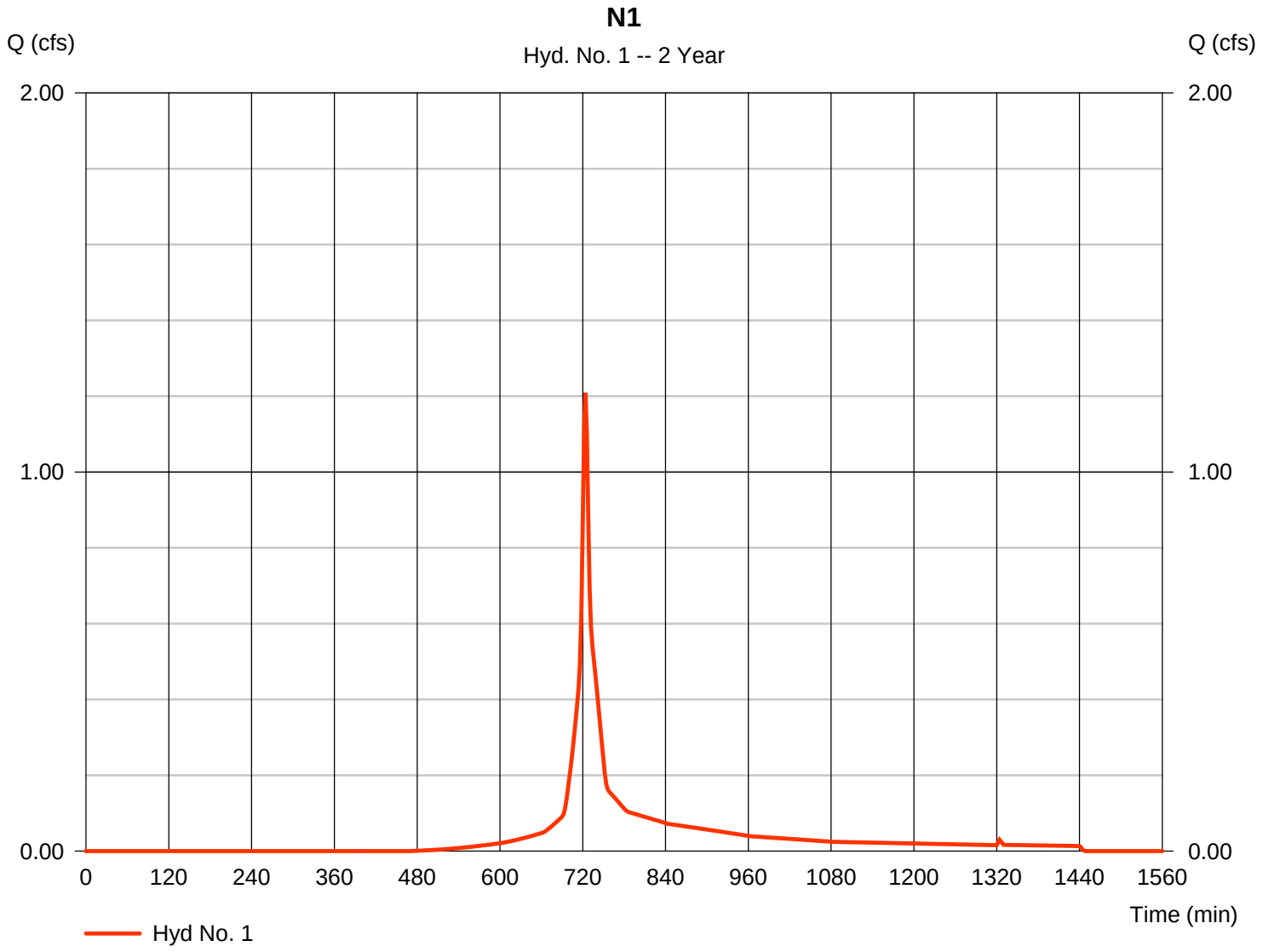
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.209	2	724	3,615	------	------	------	N1
2	Reservoir	0.000	2	658	0	1	65.60	1,658	N1 Infiltration Swale
3	SCS Runoff	0.132	2	728	503	------	------	------	N2
4	SCS Runoff	0.325	2	724	986	------	------	------	S1
5	Reservoir	0.138	2	734	688	4	77.05	415	S1 Dry Well
6	SCS Runoff	0.146	2	724	488	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.209 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	3,615 cuft
Drainage area	=	0.539 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



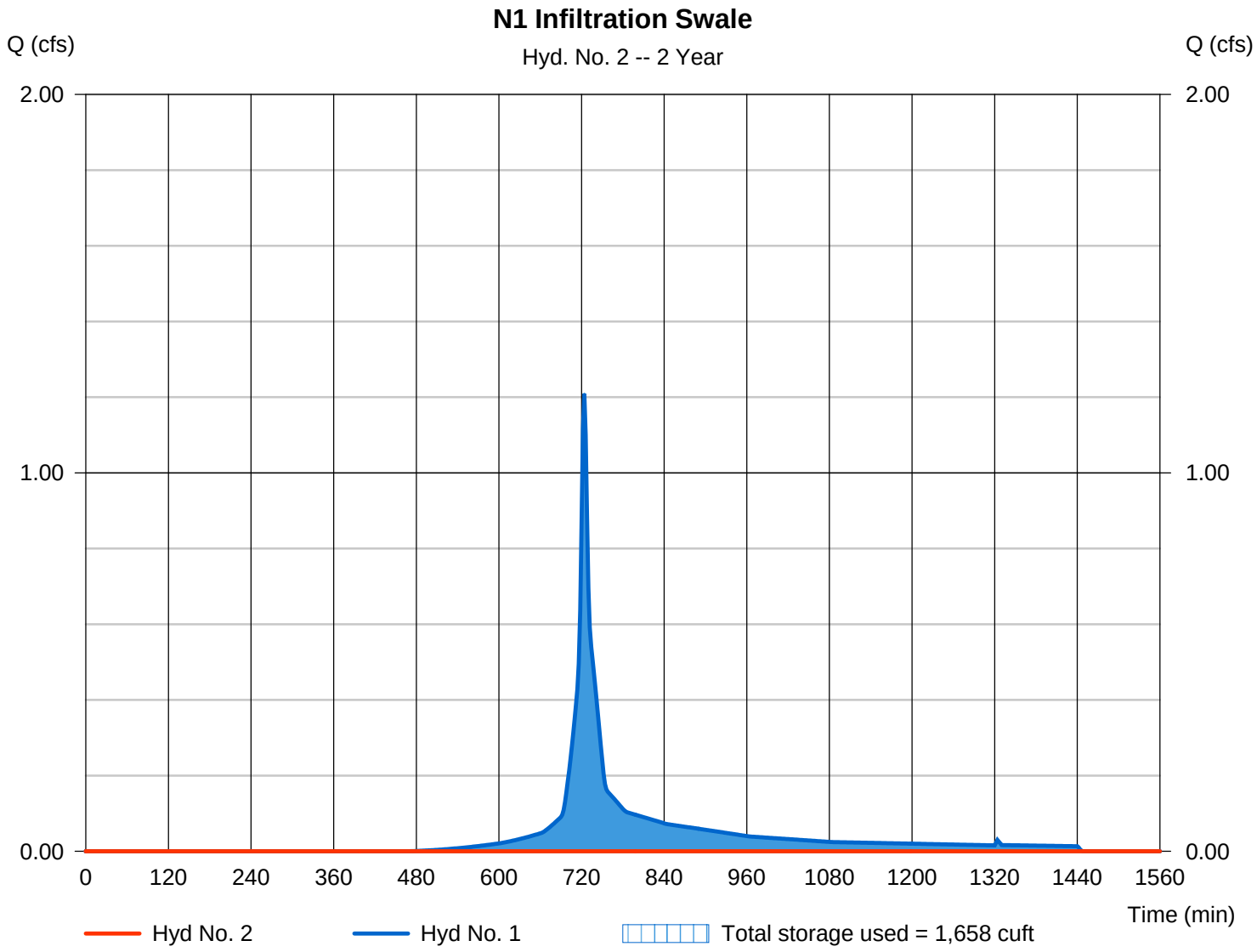
Hydrograph Report

Hyd. No. 2

N1 Infiltration Swale

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	658 min
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - N1	Max. Elevation	=	65.60 ft
Reservoir name	=	24-inch Perforated Pipe in Storage	Max. Storage	=	1,658 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Thursday, 05 / 17 / 2018

Pond No. 1 - 24-inch Perforated Pipe in Stone

Pond Data

Pond storage is based on user-defined values.

Barrel - Circular Span = 2.00 x 2.00 ft, Barrel Len = 140.00 ft, No. Barrels = 3, Slope = 0.00%, Headers = Yes
Encasement - Invert elev. = 64.00 ft, Width = 5.00 ft, Height = 4.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	64.00	n/a	0	0
0.40	64.40	n/a	360	360
0.80	64.80	n/a	360	720
1.20	65.20	n/a	404	1,124
1.60	65.60	n/a	530	1,654
2.00	66.00	n/a	570	2,225
2.40	66.40	n/a	570	2,795
2.80	66.80	n/a	530	3,325
3.20	67.20	n/a	404	3,729
3.60	67.60	n/a	360	4,089
4.00	68.00	n/a	360	4,449
4.50	68.50	n/a	100	4,549
5.00	69.00	n/a	725	5,274

Culvert / Orifice Structures

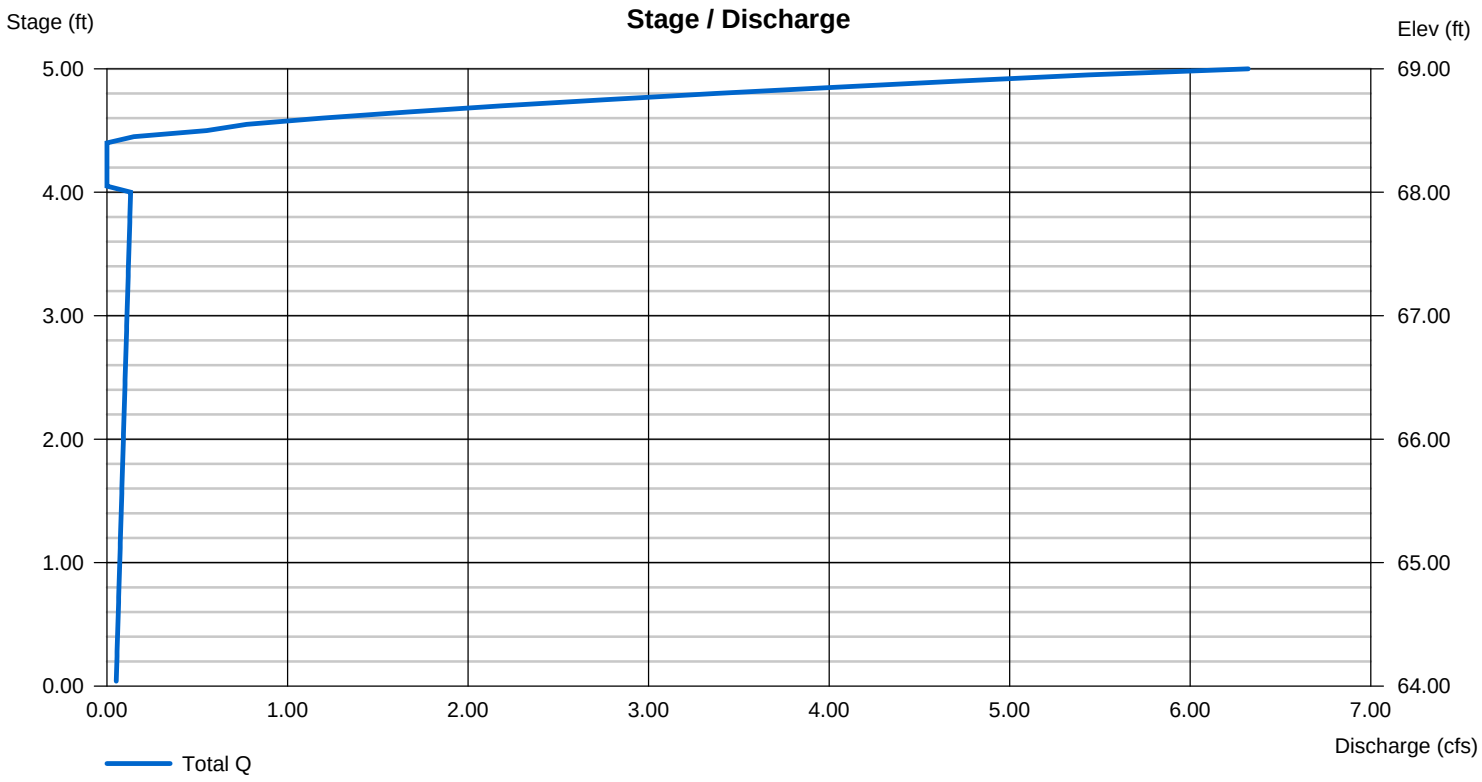
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 68.40	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

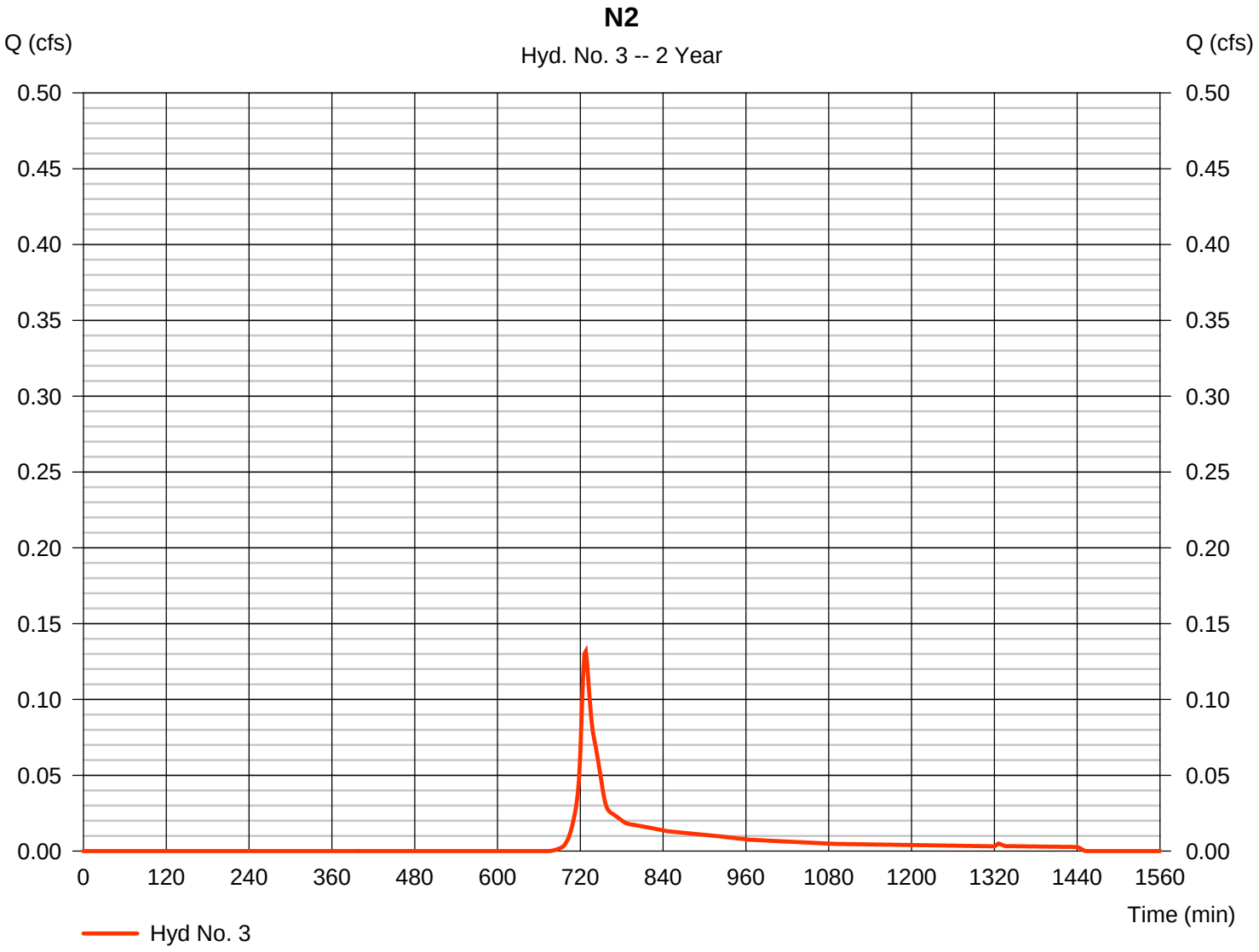


Hydrograph Report

Hyd. No. 3

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.132 cfs
Storm frequency	=	2 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	503 cuft
Drainage area	=	0.150 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

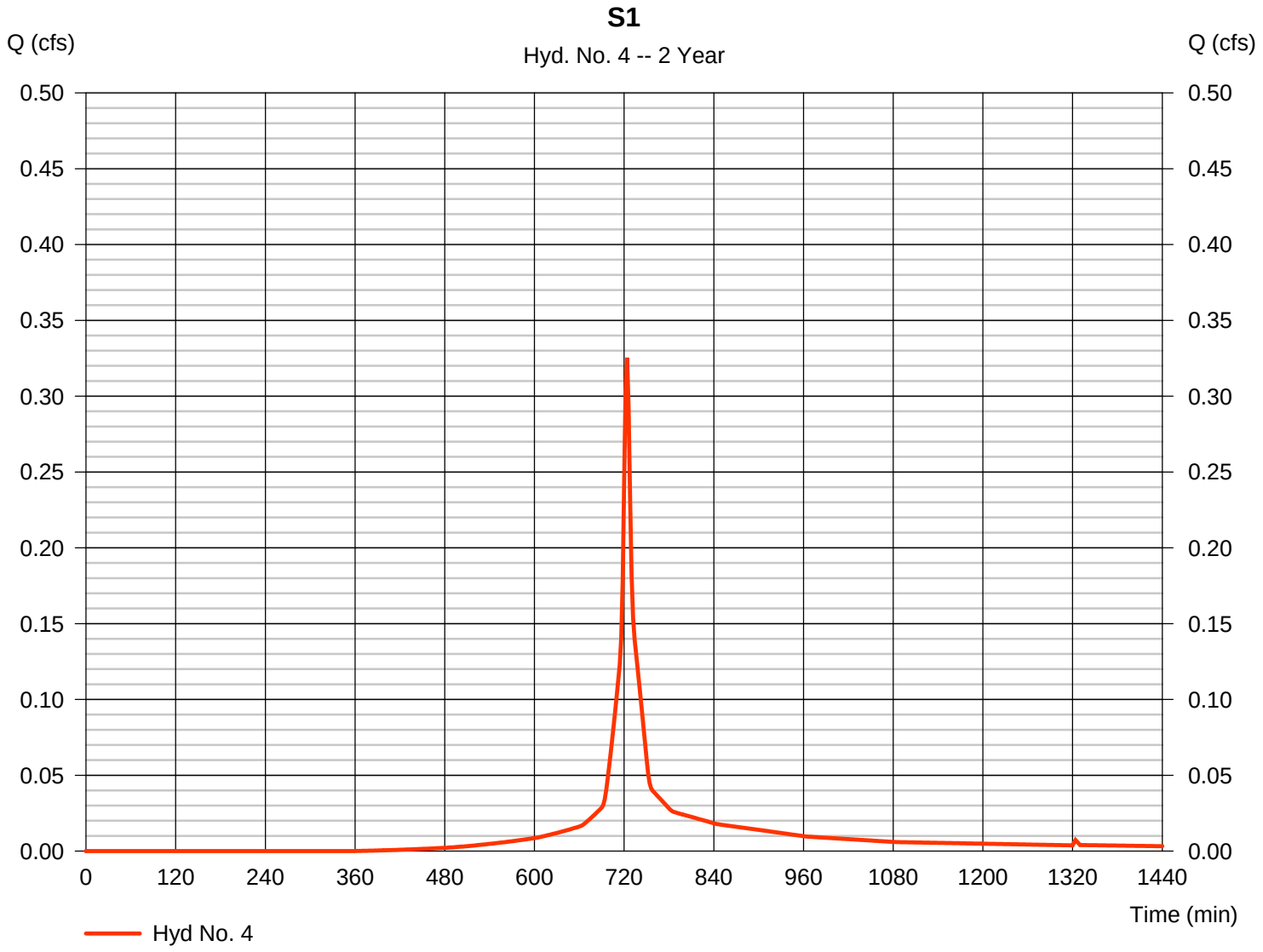


Hydrograph Report

Hyd. No. 4

S1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.325 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 986 cuft
Drainage area	= 0.121 ac	Curve number	= 89
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



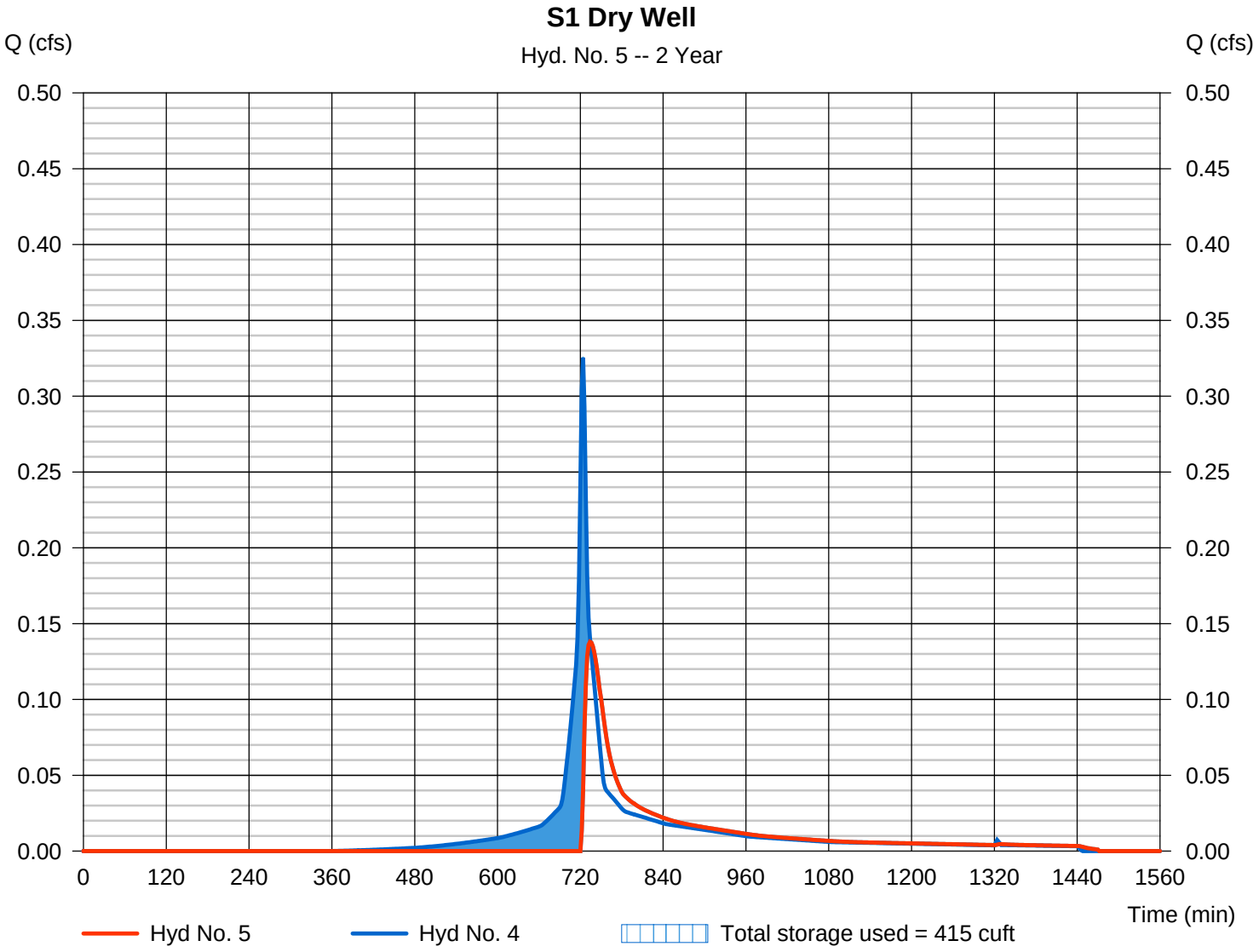
Hydrograph Report

Hyd. No. 5

S1 Dry Well

Hydrograph type	= Reservoir	Peak discharge	= 0.138 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 688 cuft
Inflow hyd. No.	= 4 - S1	Max. Elevation	= 77.05 ft
Reservoir name	= Drywell	Max. Storage	= 415 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 2 - Drywell

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	71.00	n/a	0	0
6.00	77.00	n/a	297	297
6.20	77.20	n/a	503	800

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

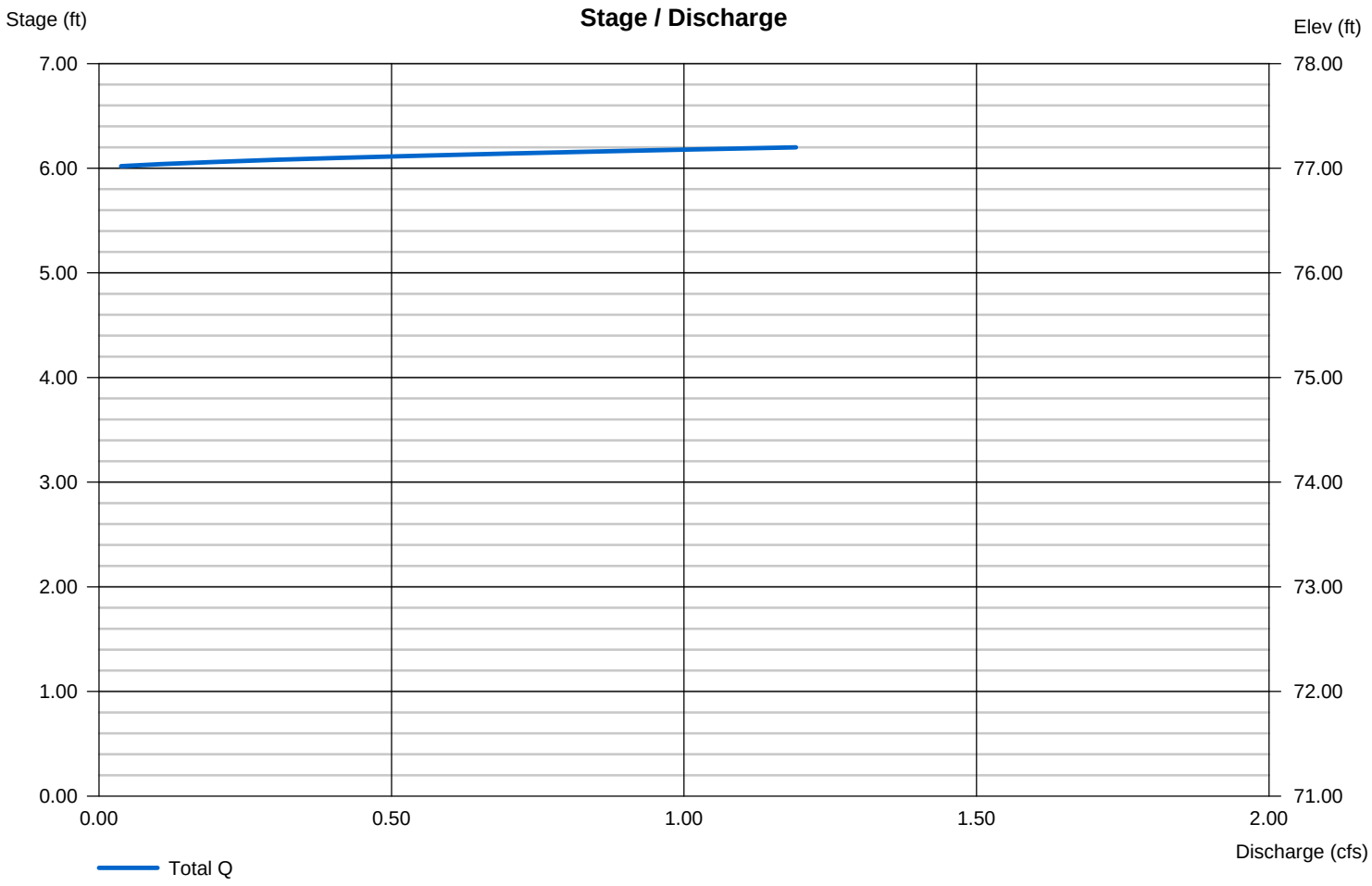
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 77.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

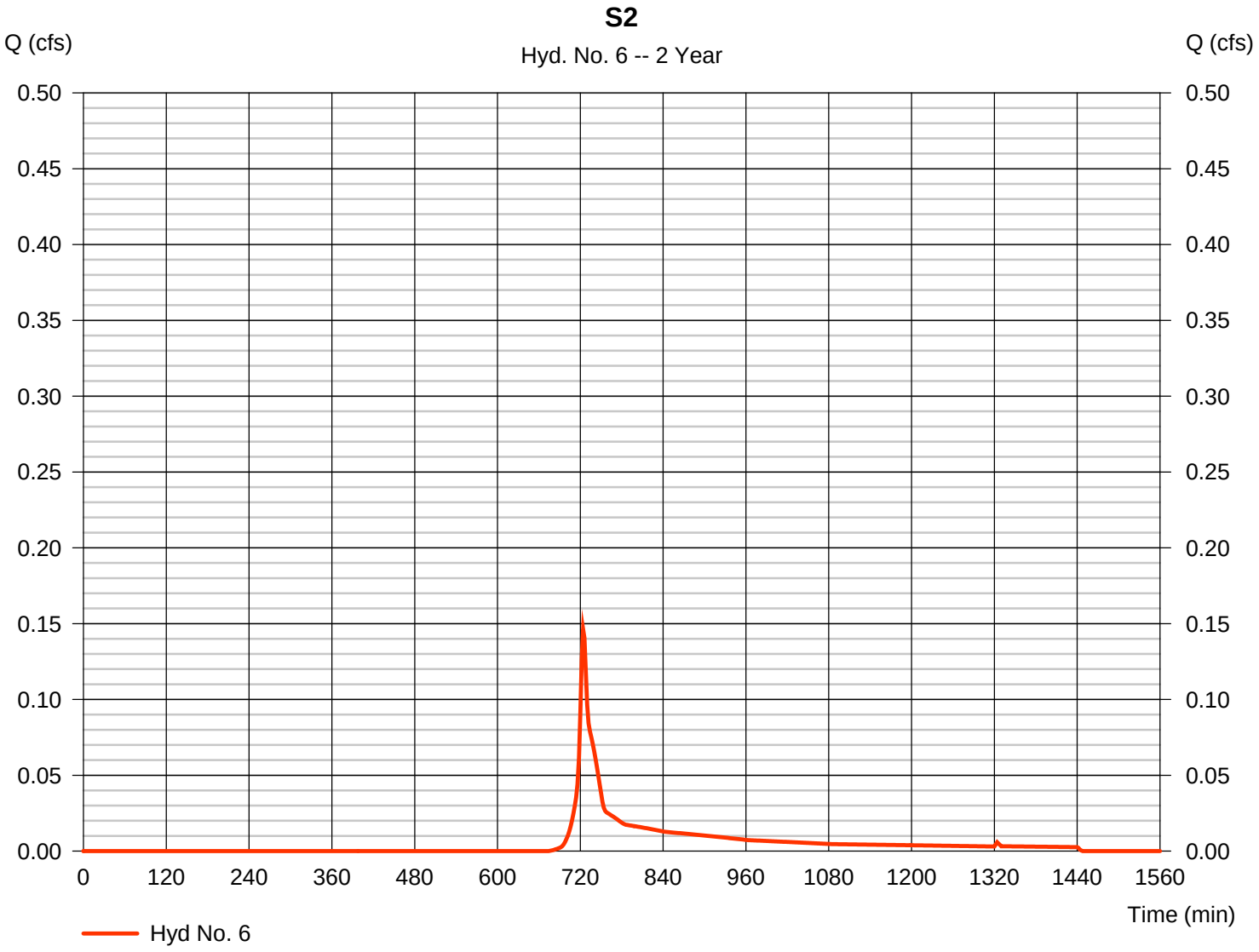


Hydrograph Report

Hyd. No. 6

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.146 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	488 cuft
Drainage area	=	0.155 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

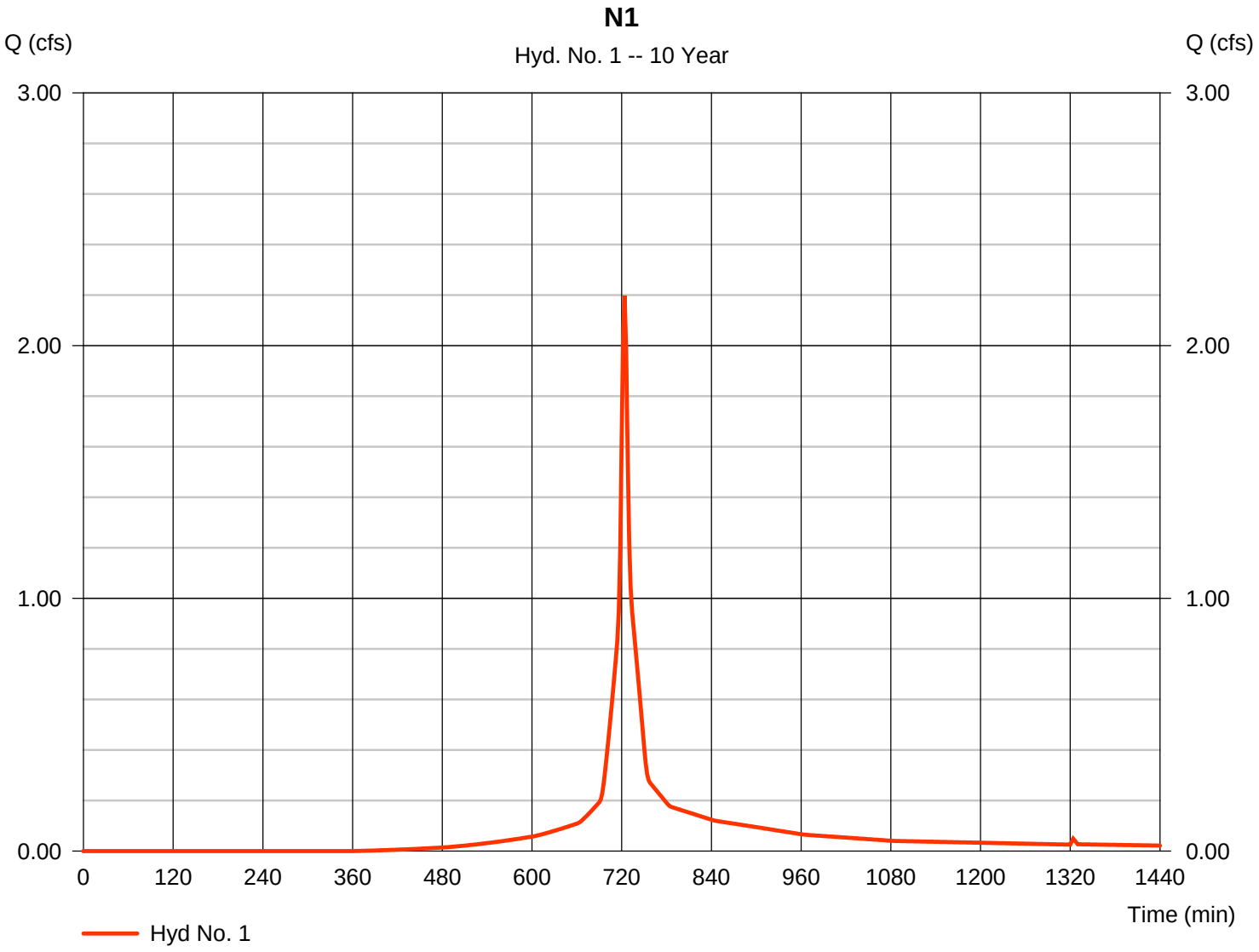
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.199	2	724	6,657	------	------	------	N1
2	Reservoir	0.000	2	564	0	1	67.01	3,536	N1 Infiltration Swale
3	SCS Runoff	0.337	2	726	1,177	------	------	------	N2
4	SCS Runoff	0.550	2	724	1,707	------	------	------	S1
5	Reservoir	0.391	2	728	1,409	4	77.10	536	S1 Dry Well
6	SCS Runoff	0.375	2	724	1,140	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.199 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	6,657 cuft
Drainage area	=	0.539 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



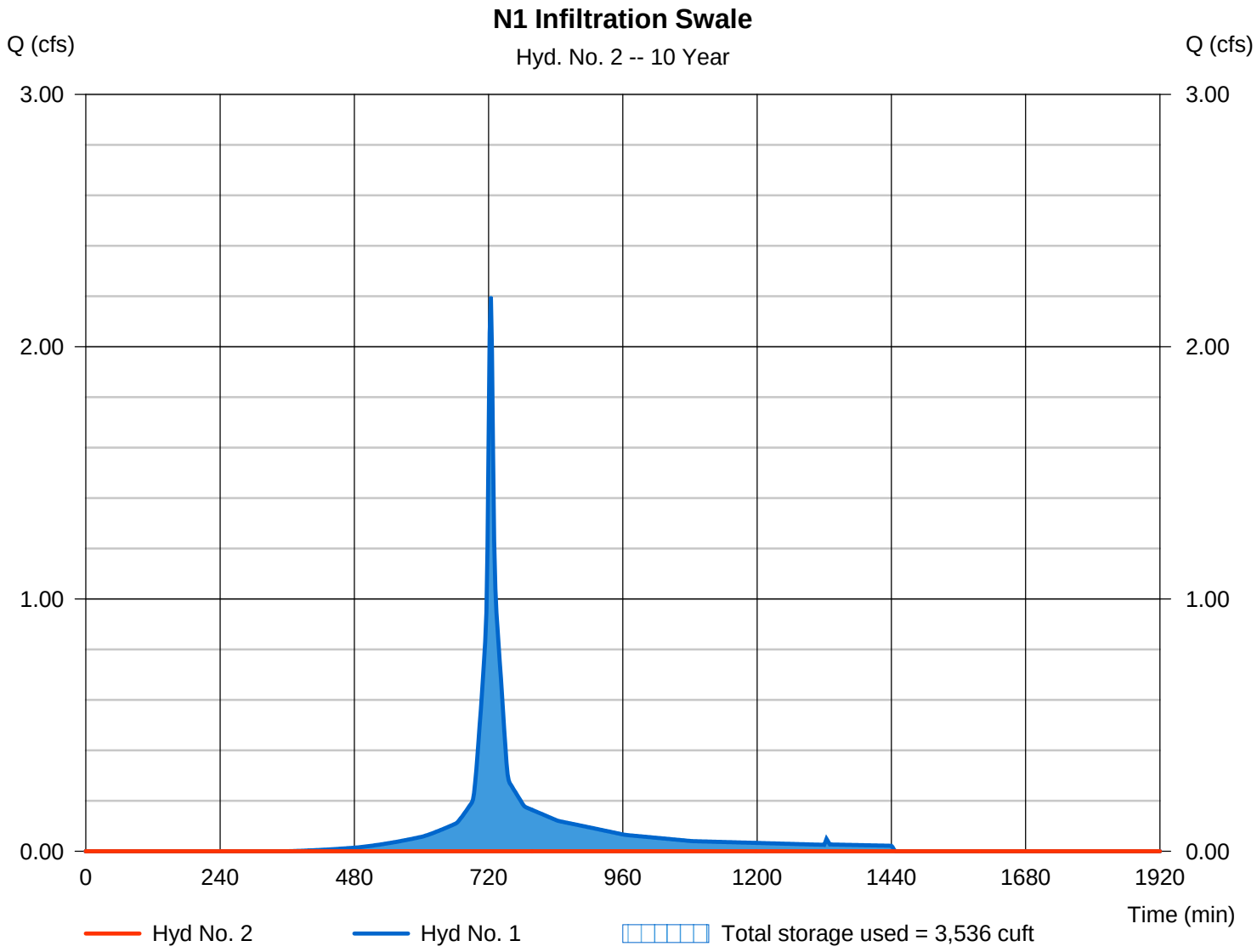
Hydrograph Report

Hyd. No. 2

N1 Infiltration Swale

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	564 min
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	1 - N1	Max. Elevation	=	67.01 ft
Reservoir name	=	24-inch Perforated Pipe in Storage	Max. Storage	=	3,536 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

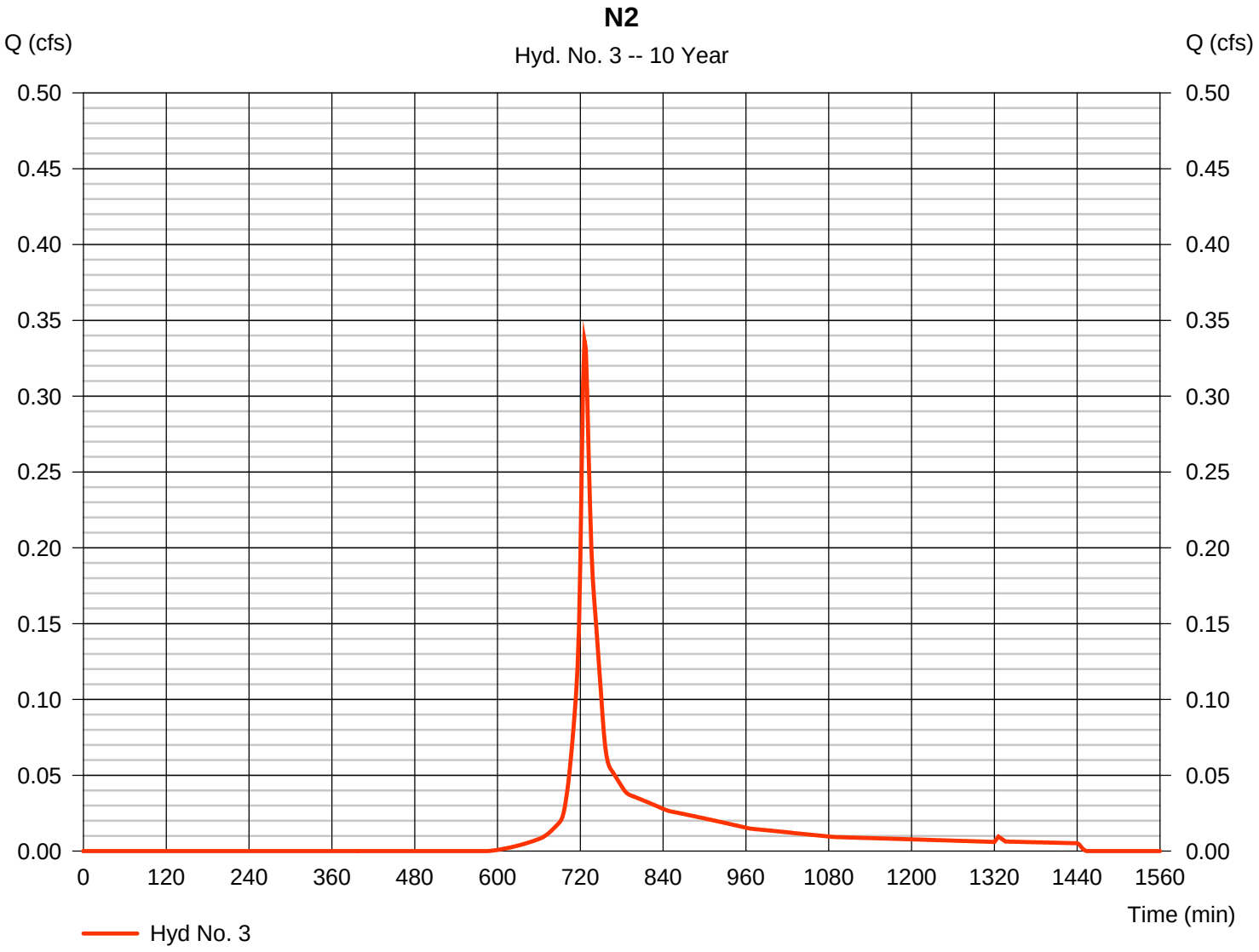


Hydrograph Report

Hyd. No. 3

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.337 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,177 cuft
Drainage area	=	0.150 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

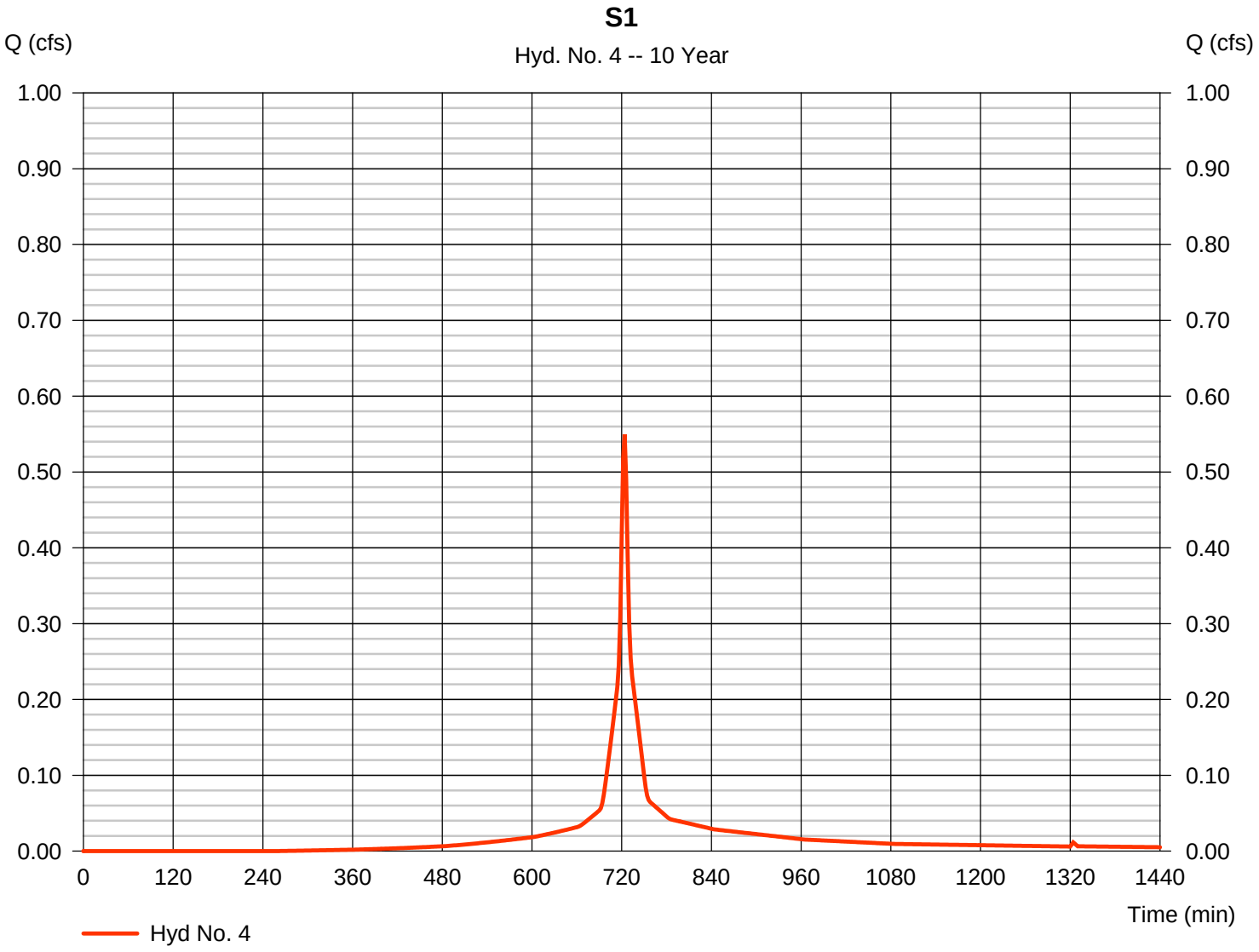


Hydrograph Report

Hyd. No. 4

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.550 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,707 cuft
Drainage area	=	0.121 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



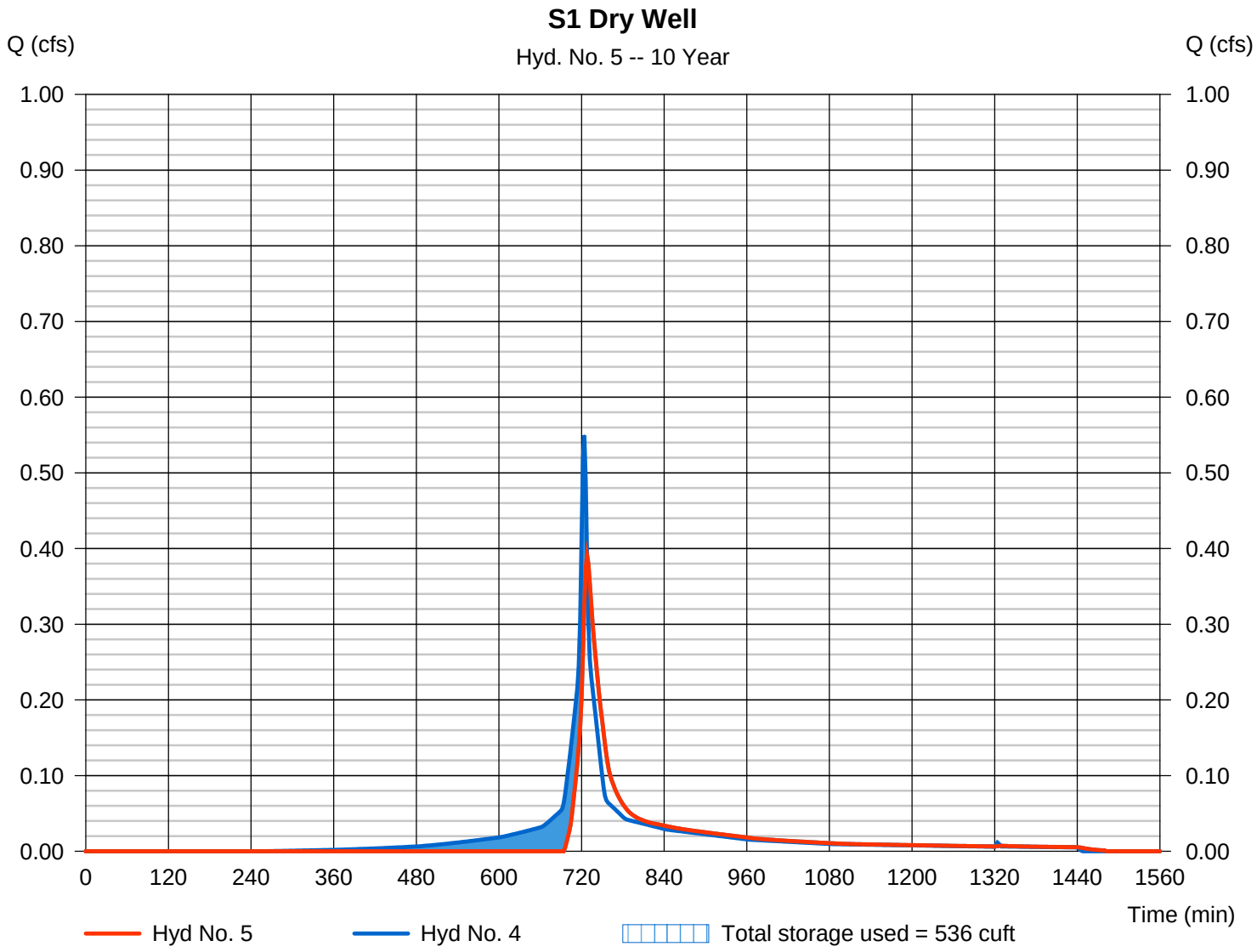
Hydrograph Report

Hyd. No. 5

S1 Dry Well

Hydrograph type	=	Reservoir	Peak discharge	=	0.391 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,409 cuft
Inflow hyd. No.	=	4 - S1	Max. Elevation	=	77.10 ft
Reservoir name	=	Drywell	Max. Storage	=	536 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

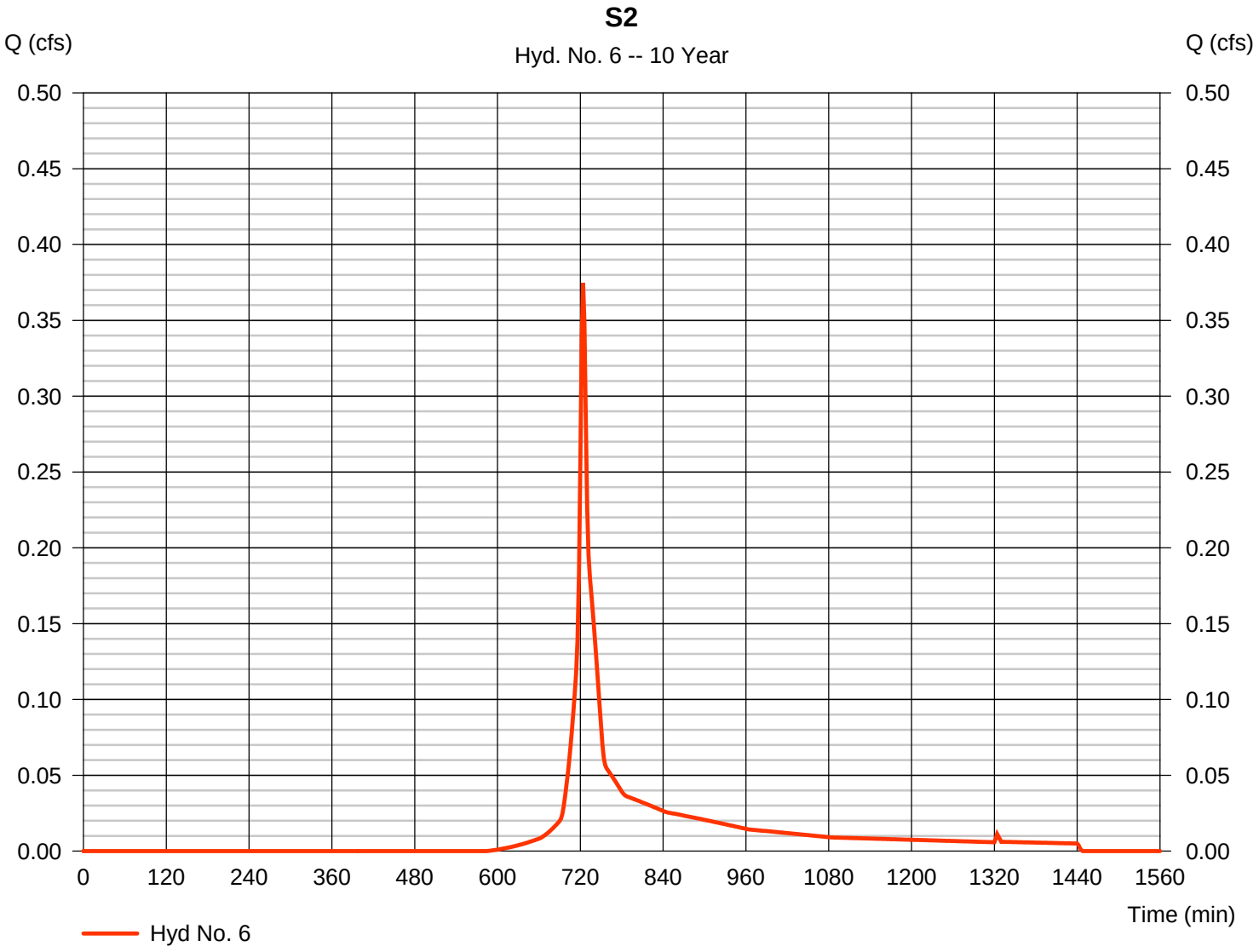


Hydrograph Report

Hyd. No. 6

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.375 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,140 cuft
Drainage area	=	0.155 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.39 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

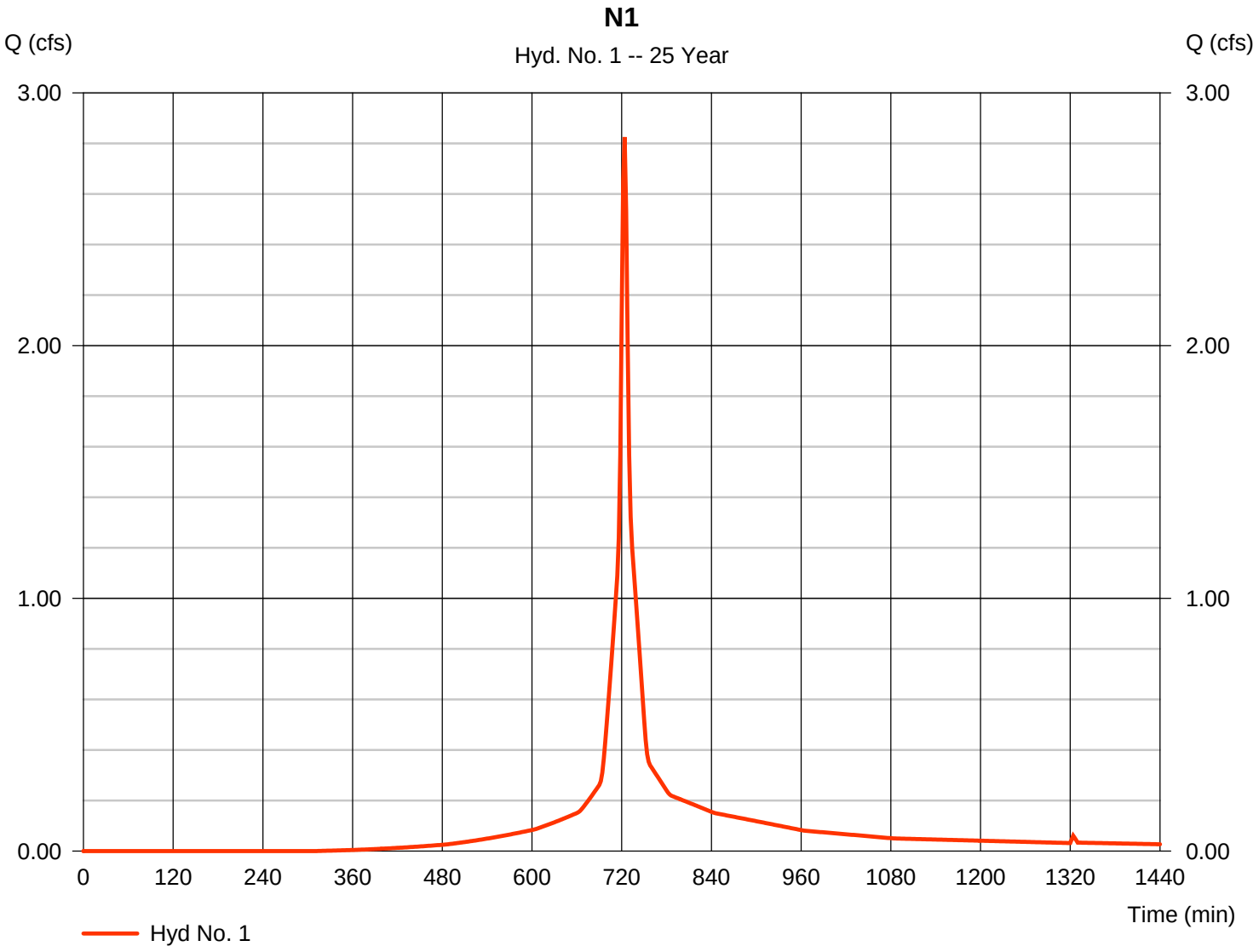
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.826	2	724	8,646	------	------	------	N1
2	Reservoir	0.260	2	774	1,070	1	68.48	4,543	N1 Infiltration Swale
3	SCS Runoff	0.483	2	726	1,661	------	------	------	N2
4	SCS Runoff	0.689	2	724	2,170	------	------	------	S1
5	Reservoir	0.512	2	728	1,871	4	77.11	583	S1 Dry Well
6	SCS Runoff	0.536	2	724	1,609	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.826 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	8,646 cuft
Drainage area	=	0.539 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



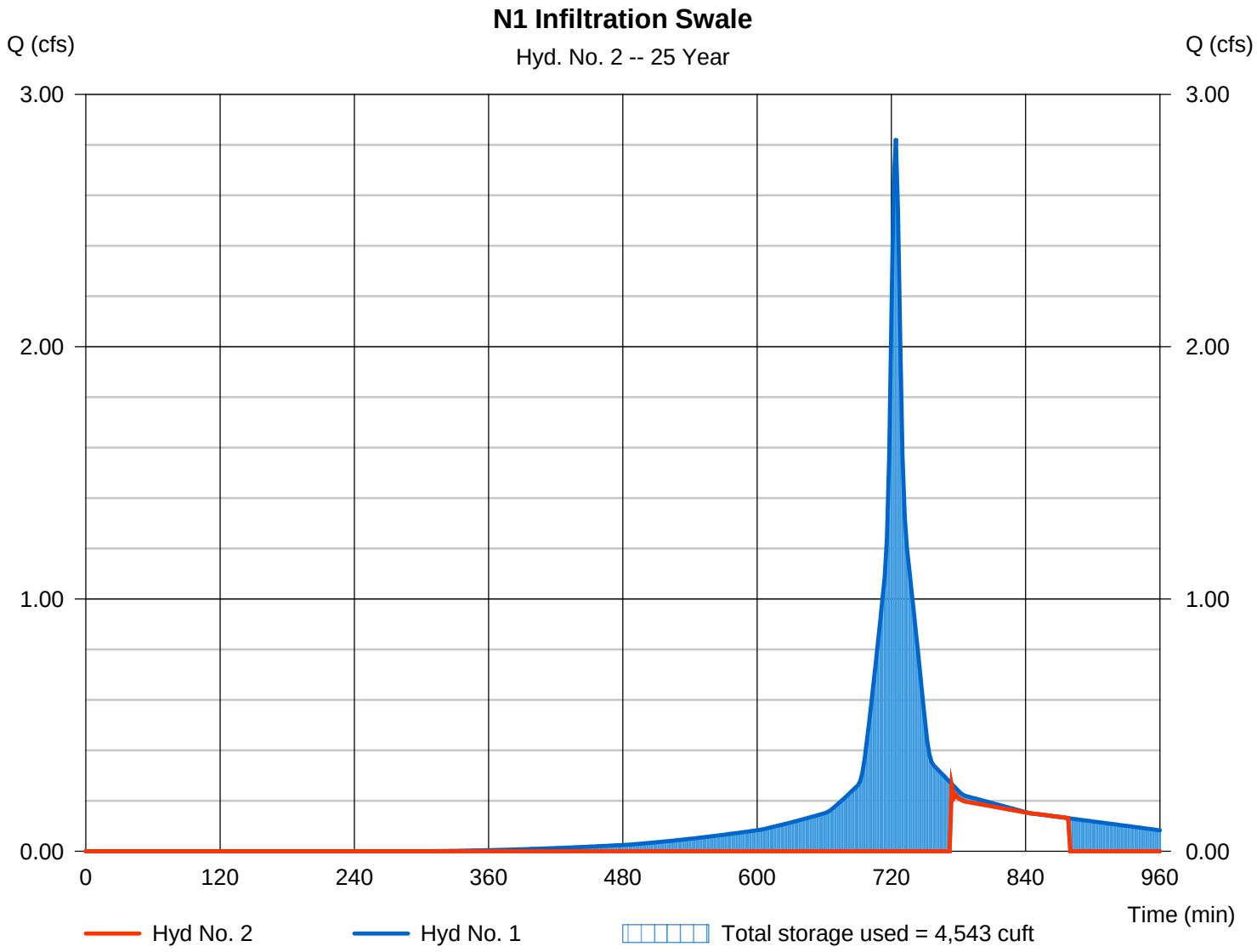
Hydrograph Report

Hyd. No. 2

N1 Infiltration Swale

Hydrograph type	=	Reservoir	Peak discharge	=	0.260 cfs
Storm frequency	=	25 yrs	Time to peak	=	774 min
Time interval	=	2 min	Hyd. volume	=	1,070 cuft
Inflow hyd. No.	=	1 - N1	Max. Elevation	=	68.48 ft
Reservoir name	=	24-inch Perforated Pipe in Storage	Max. Storage	=	4,543 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

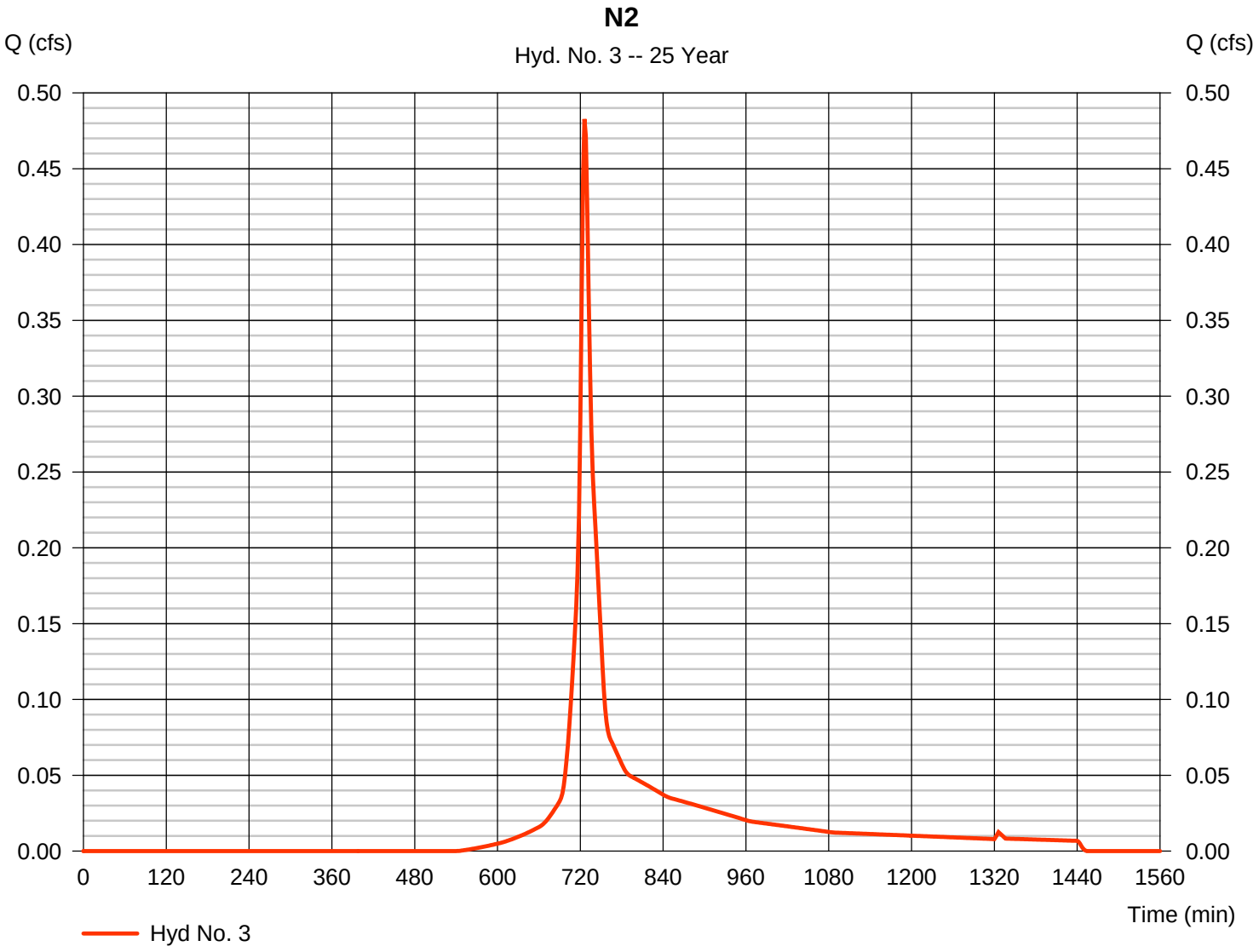


Hydrograph Report

Hyd. No. 3

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.483 cfs
Storm frequency	=	25 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,661 cuft
Drainage area	=	0.150 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

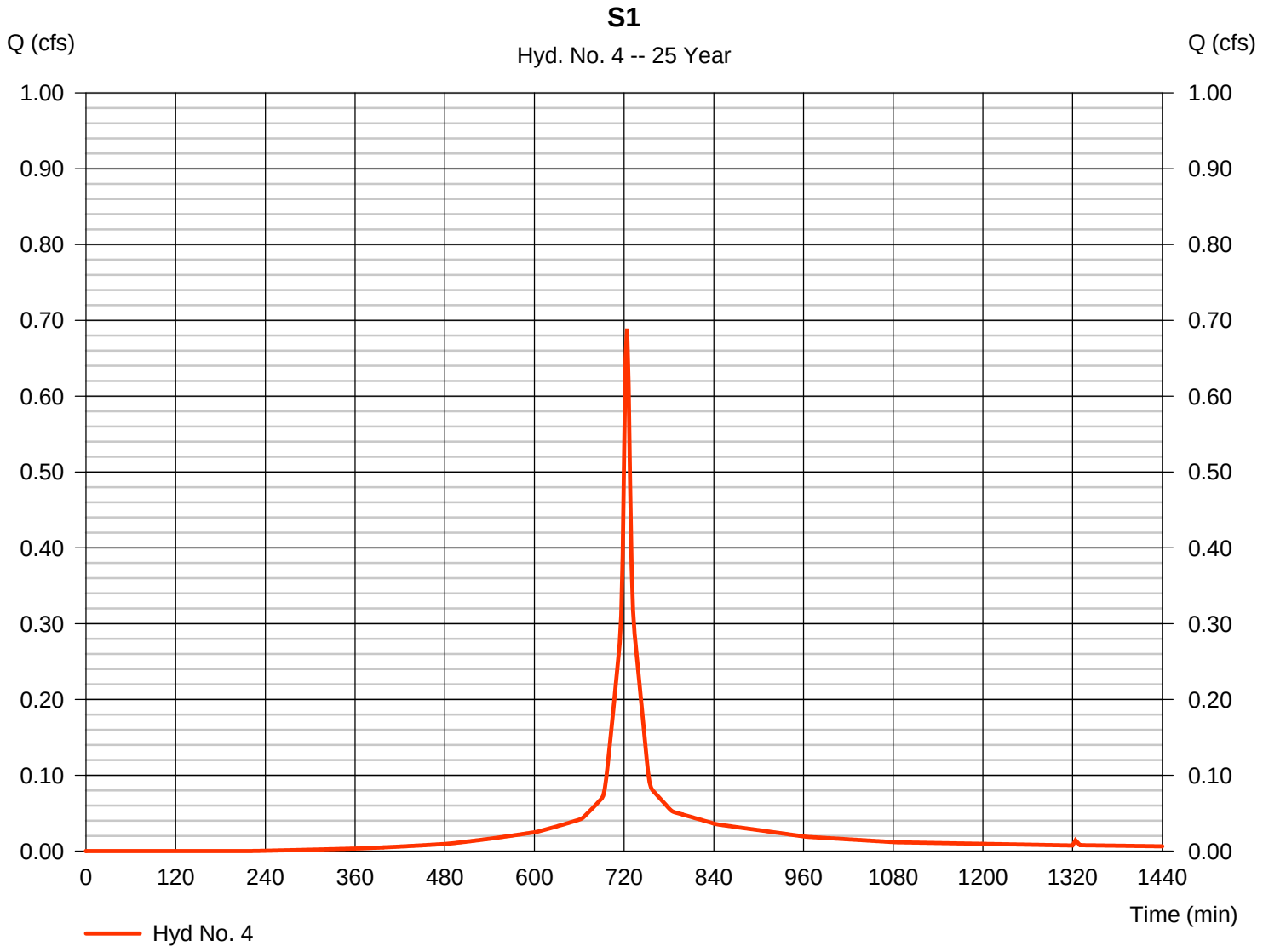


Hydrograph Report

Hyd. No. 4

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.689 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,170 cuft
Drainage area	=	0.121 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



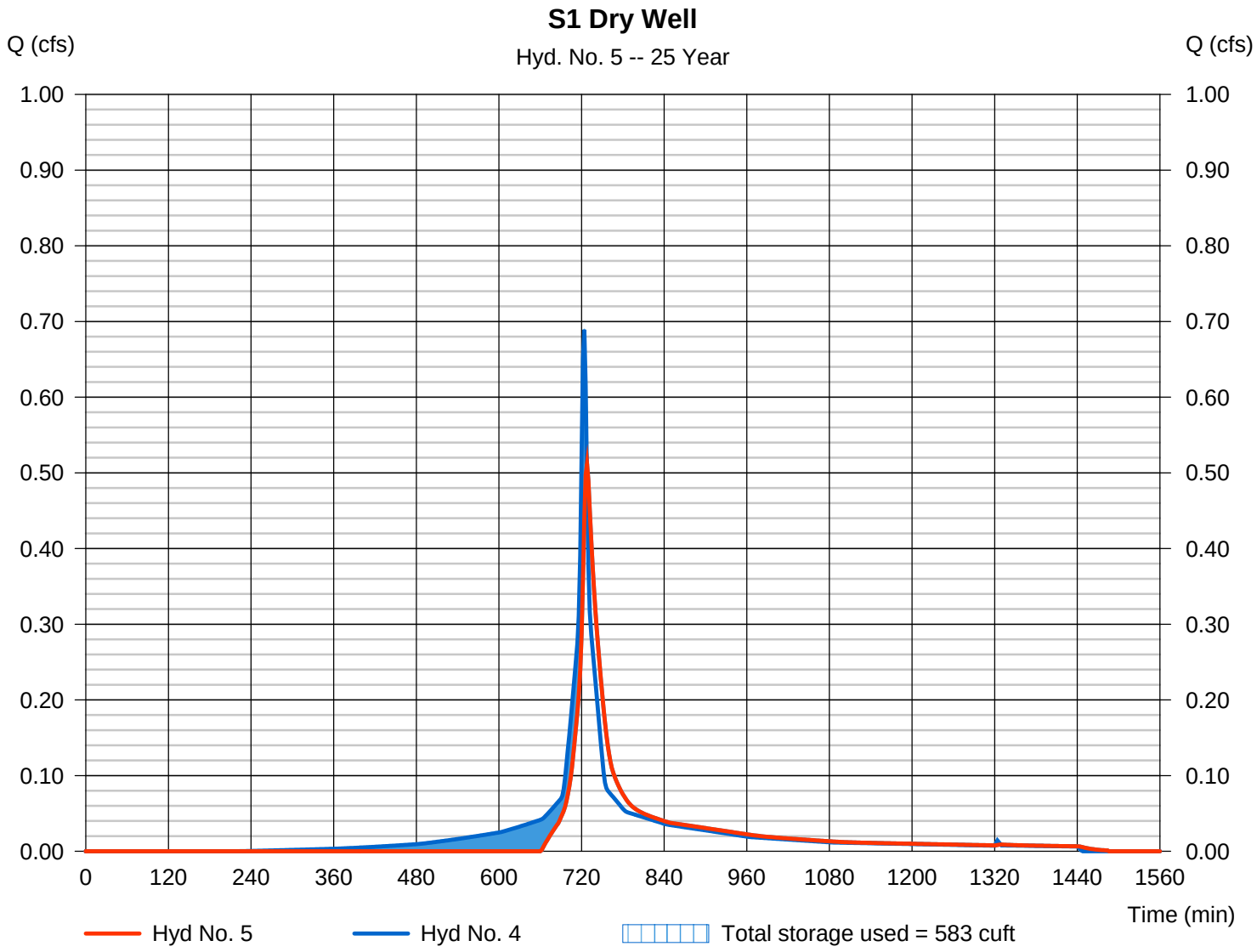
Hydrograph Report

Hyd. No. 5

S1 Dry Well

Hydrograph type	= Reservoir	Peak discharge	= 0.512 cfs
Storm frequency	= 25 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,871 cuft
Inflow hyd. No.	= 4 - S1	Max. Elevation	= 77.11 ft
Reservoir name	= Drywell	Max. Storage	= 583 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

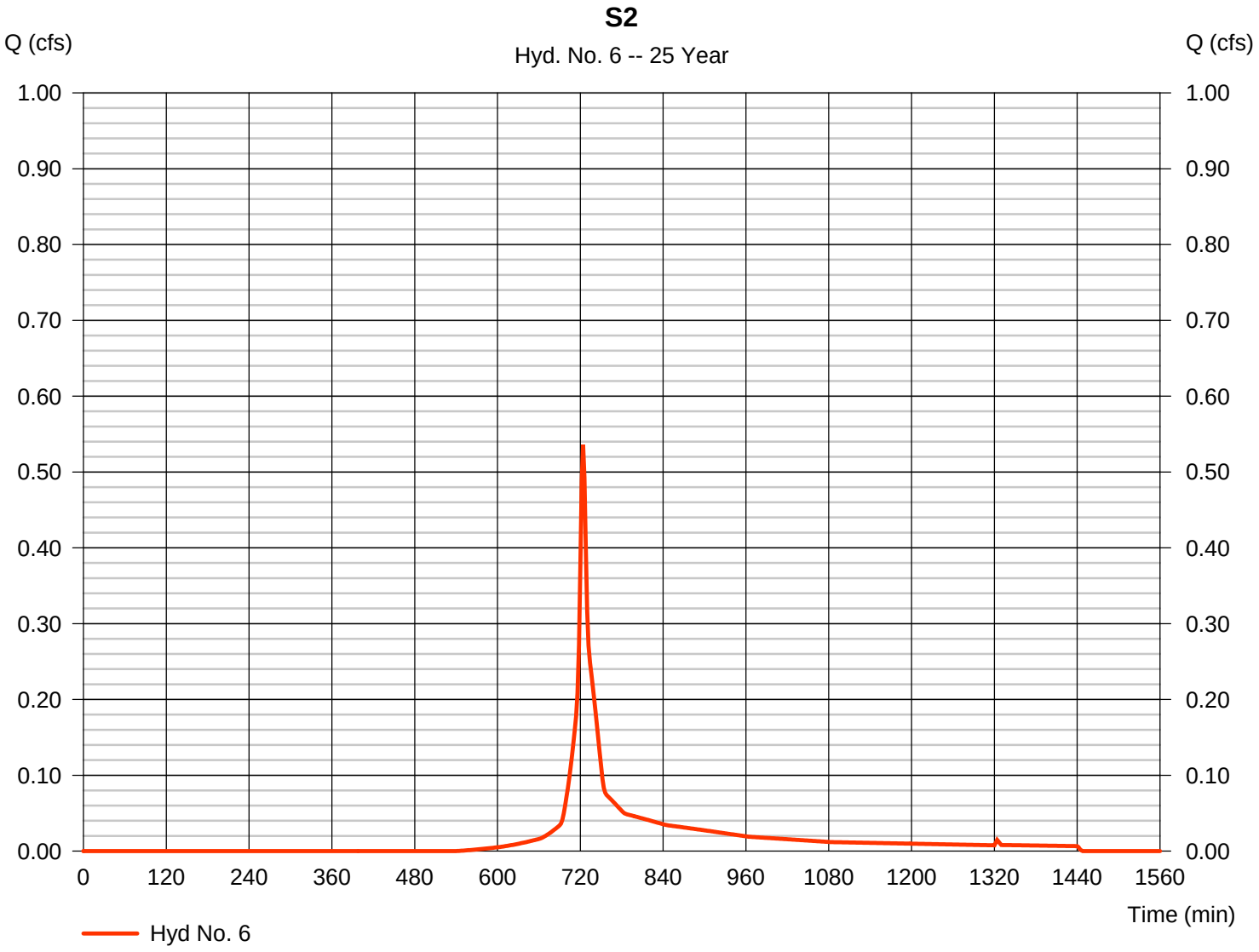


Hydrograph Report

Hyd. No. 6

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.536 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,609 cuft
Drainage area	=	0.155 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.55 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

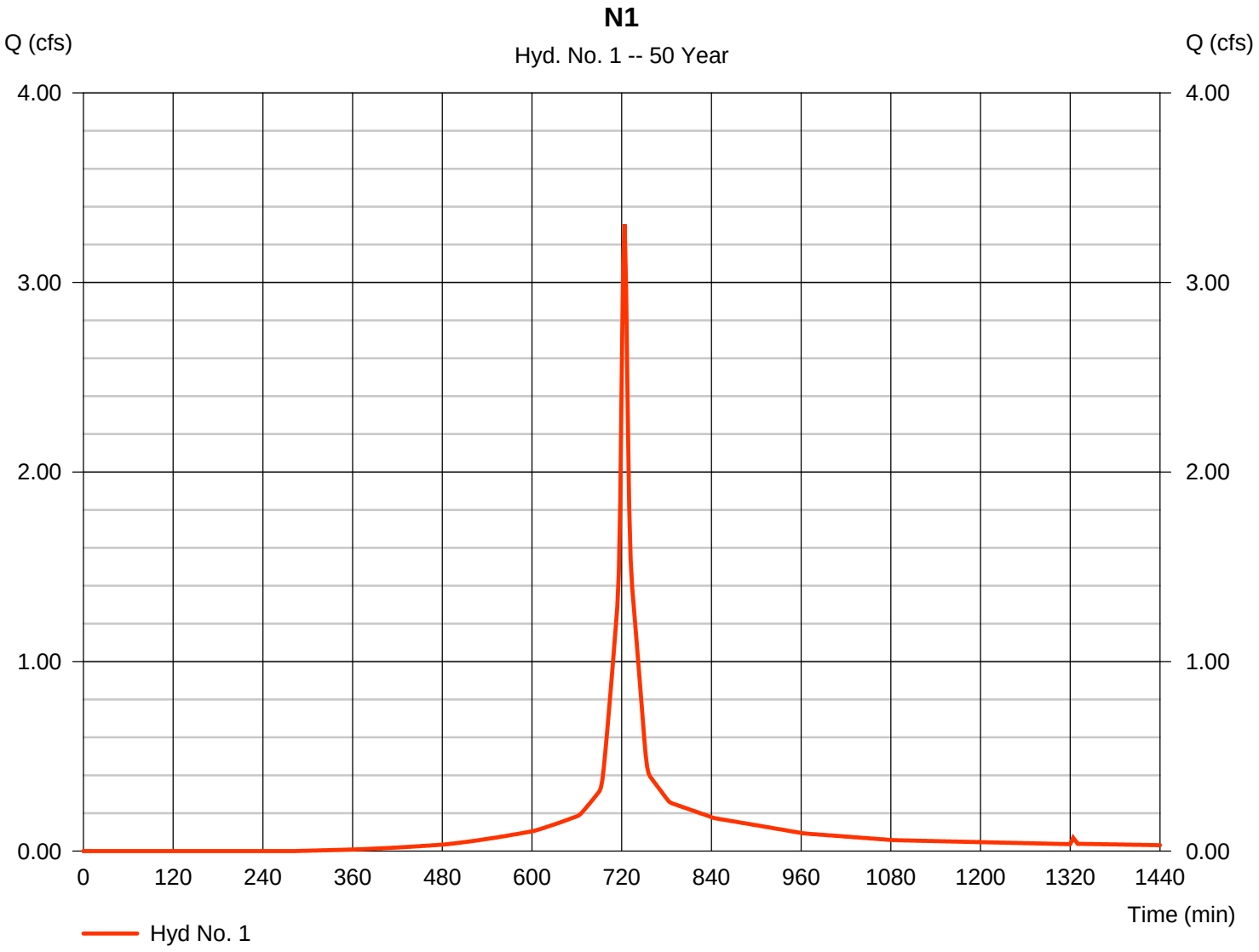
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.306	2	724	10,197	------	------	------	N1
2	Reservoir	0.934	2	744	2,545	1	68.57	4,649	N1 Infiltration Swale
3	SCS Runoff	0.600	2	726	2,052	------	------	------	N2
4	SCS Runoff	0.796	2	724	2,528	------	------	------	S1
5	Reservoir	0.601	2	728	2,229	4	77.13	615	S1 Dry Well
6	SCS Runoff	0.665	2	724	1,988	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.306 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	10,197 cuft
Drainage area	=	0.539 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



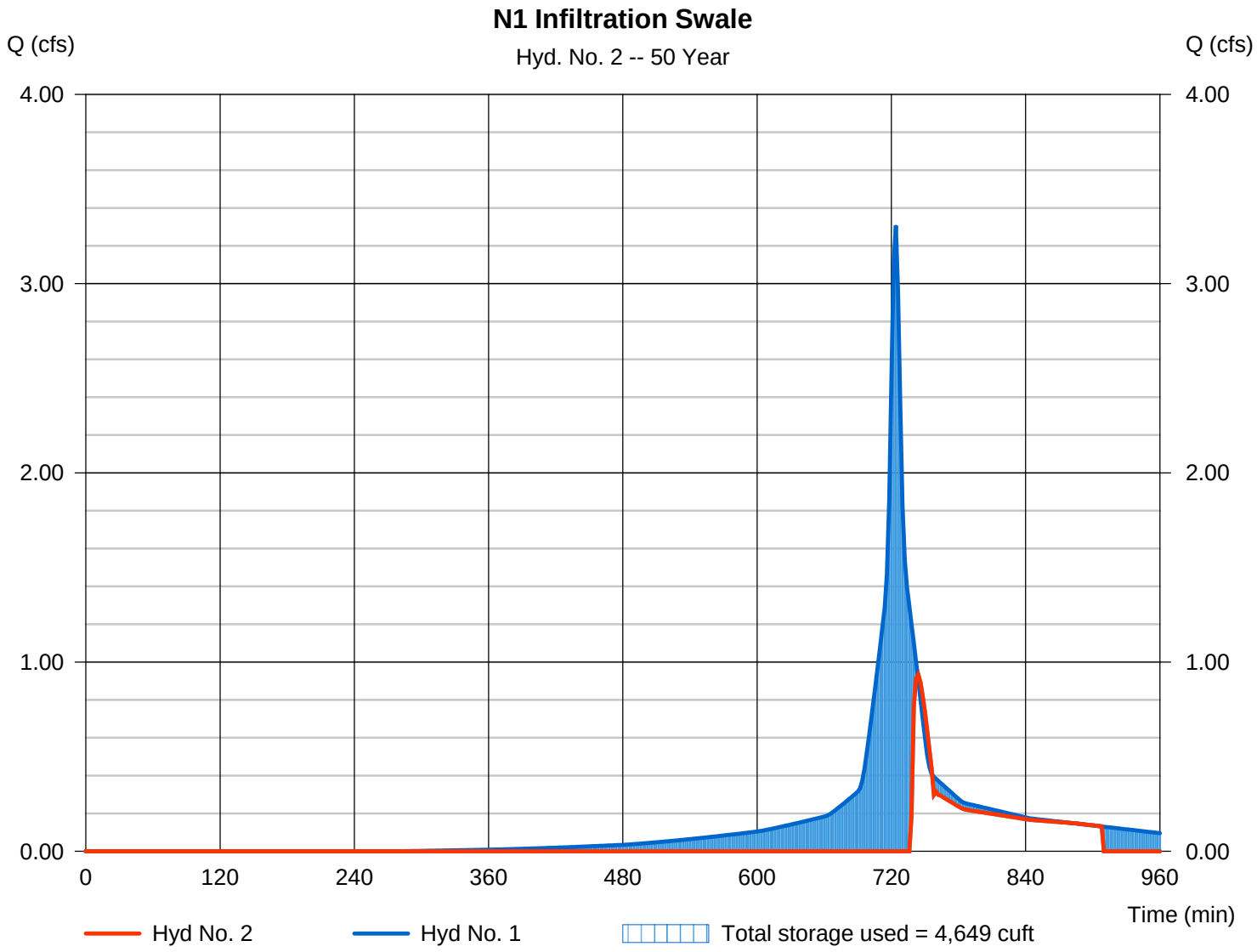
Hydrograph Report

Hyd. No. 2

N1 Infiltration Swale

Hydrograph type	=	Reservoir	Peak discharge	=	0.934 cfs
Storm frequency	=	50 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	2,545 cuft
Inflow hyd. No.	=	1 - N1	Max. Elevation	=	68.57 ft
Reservoir name	=	24-inch Perforated Pipe in Storage	Max. Storage	=	4,649 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

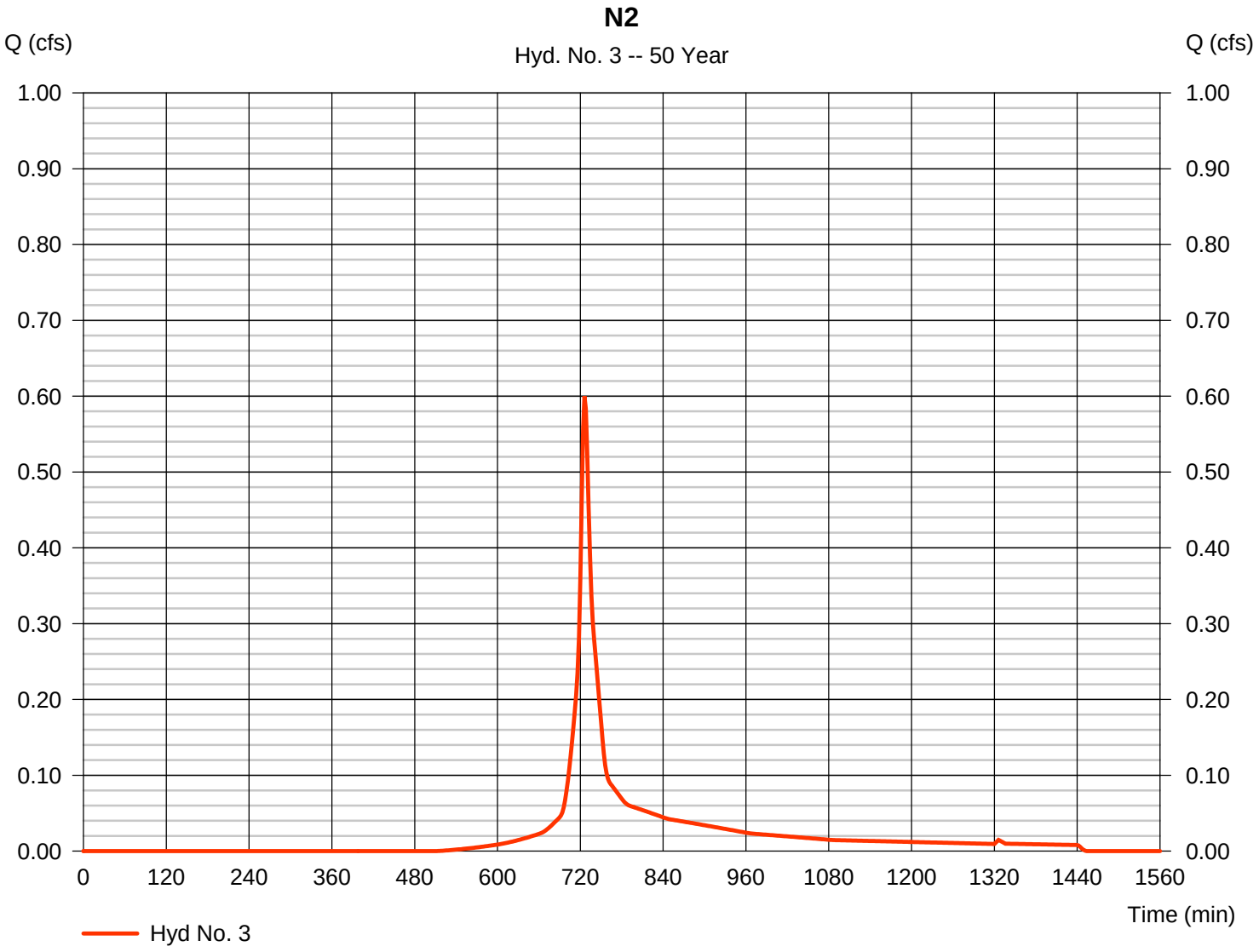


Hydrograph Report

Hyd. No. 3

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.600 cfs
Storm frequency	=	50 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,052 cuft
Drainage area	=	0.150 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

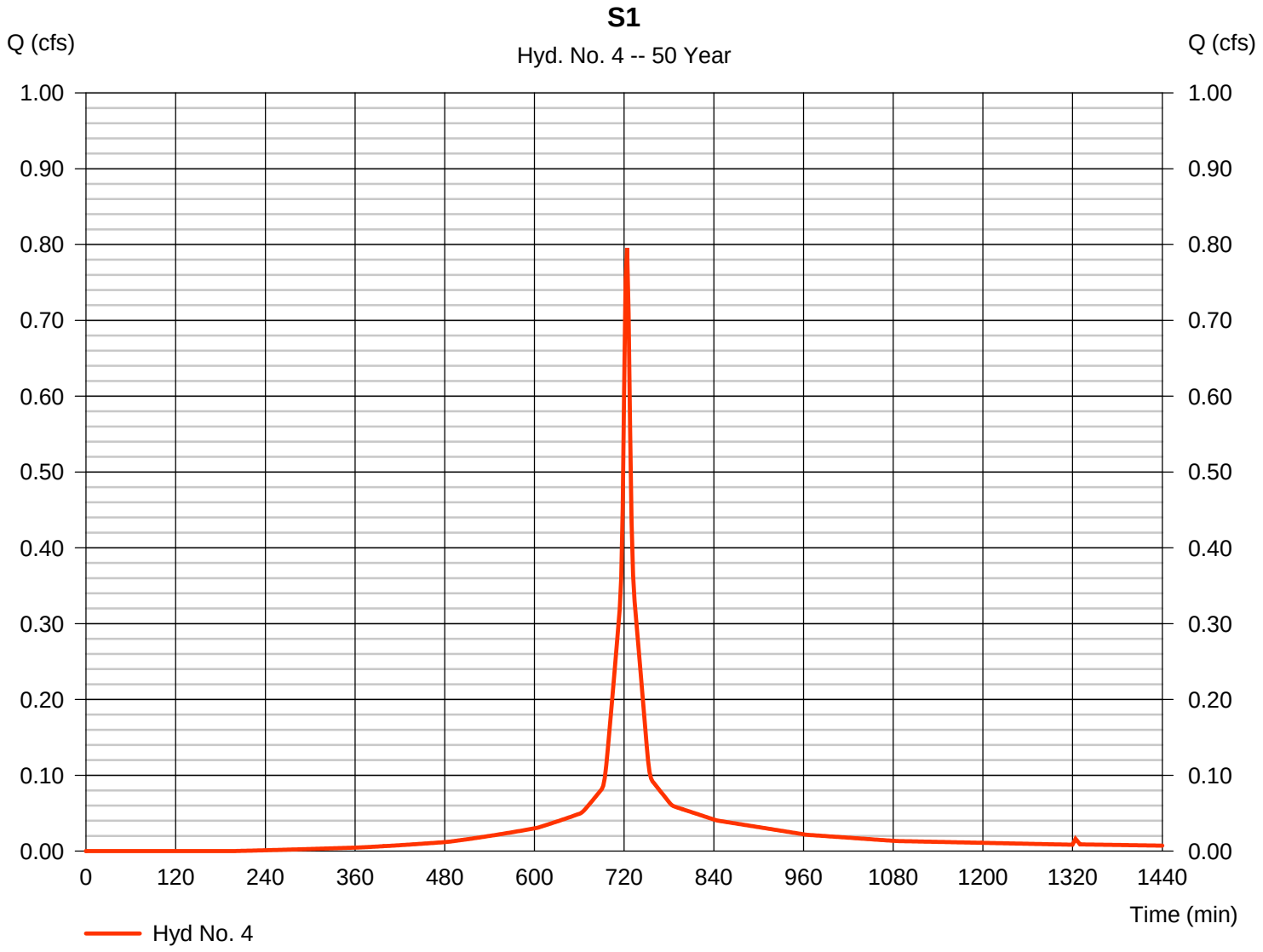


Hydrograph Report

Hyd. No. 4

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.796 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,528 cuft
Drainage area	=	0.121 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



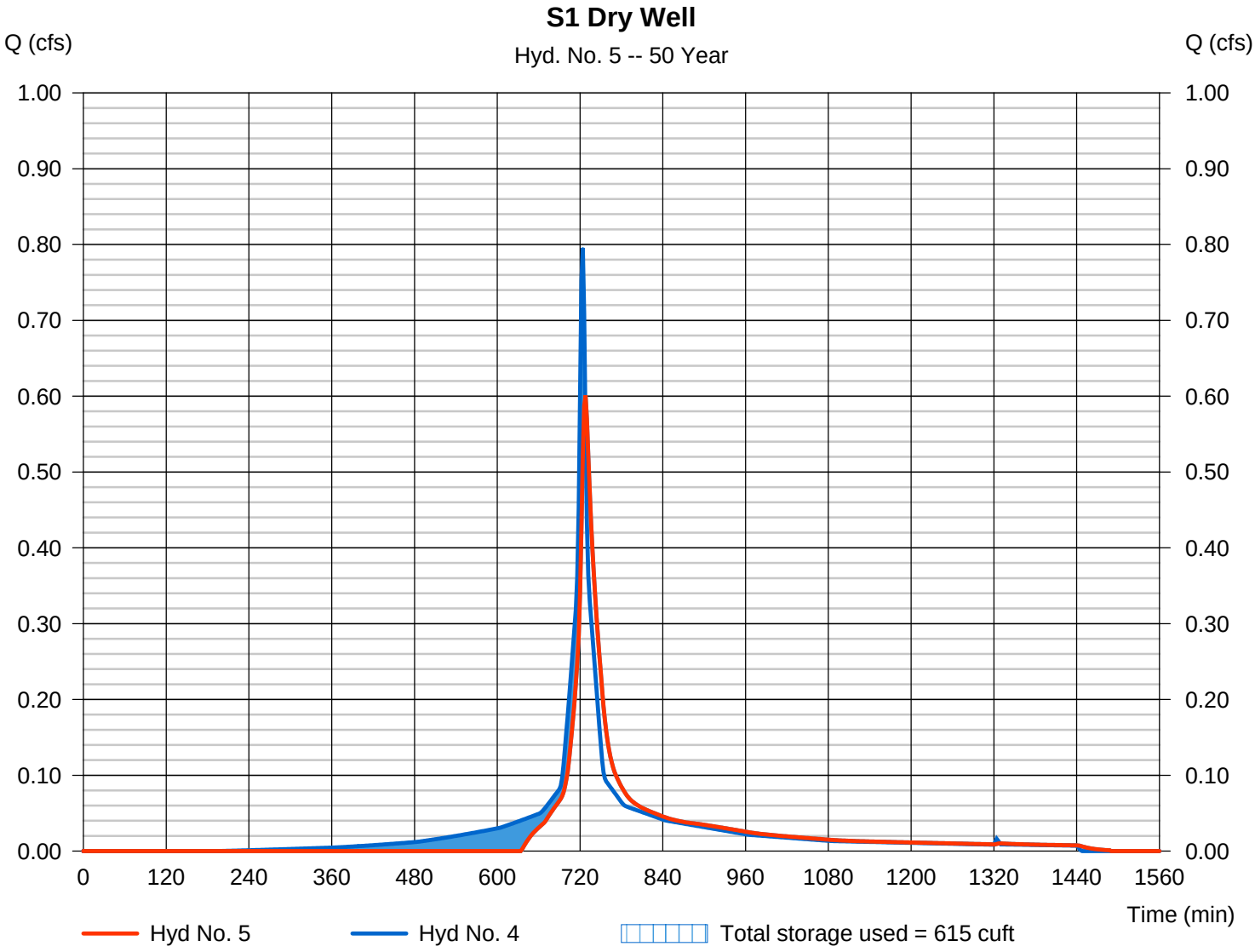
Hydrograph Report

Hyd. No. 5

S1 Dry Well

Hydrograph type	=	Reservoir	Peak discharge	=	0.601 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	2,229 cuft
Inflow hyd. No.	=	4 - S1	Max. Elevation	=	77.13 ft
Reservoir name	=	Drywell	Max. Storage	=	615 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

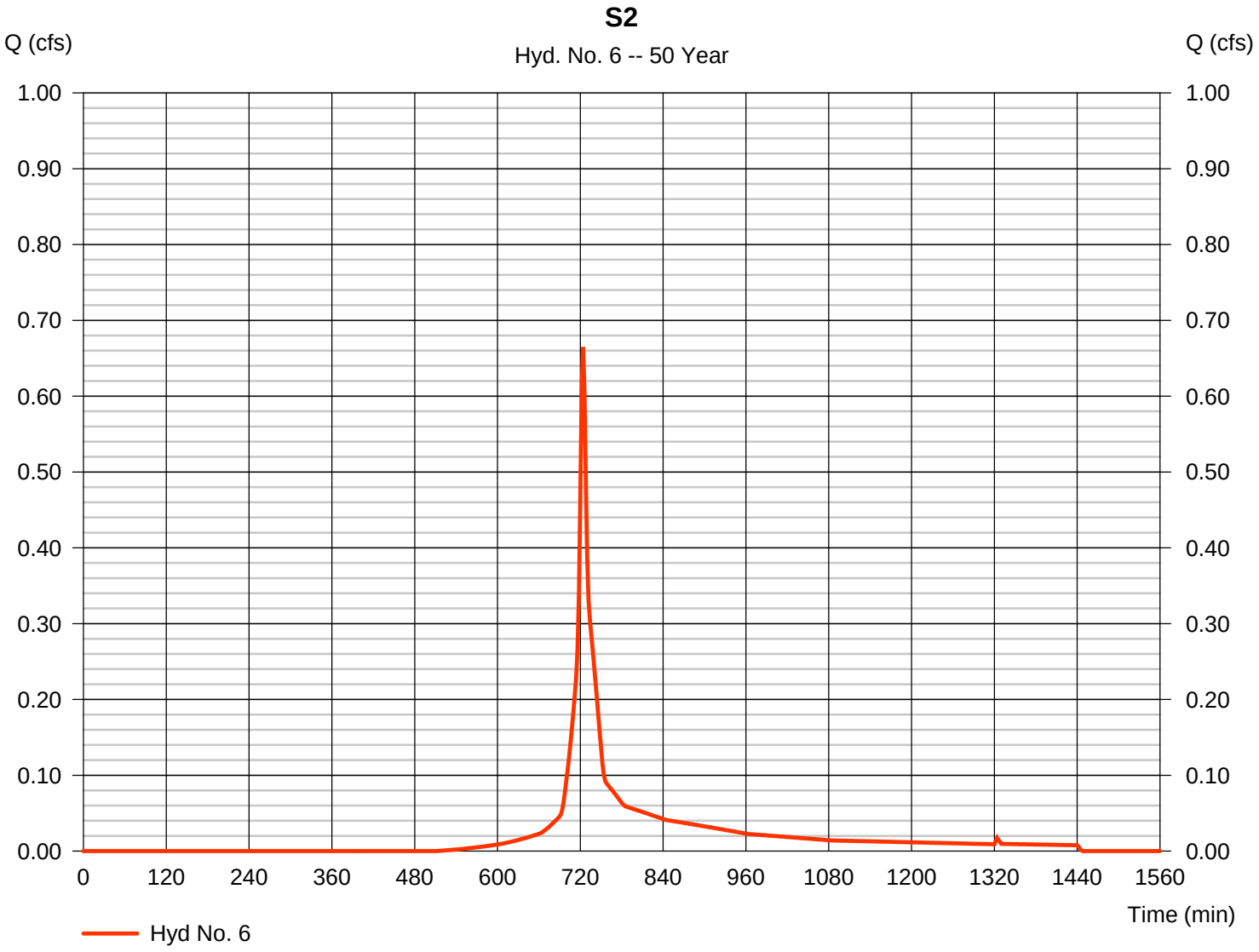


Hydrograph Report

Hyd. No. 6

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.665 cfs
Storm frequency	=	50 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,988 cuft
Drainage area	=	0.155 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

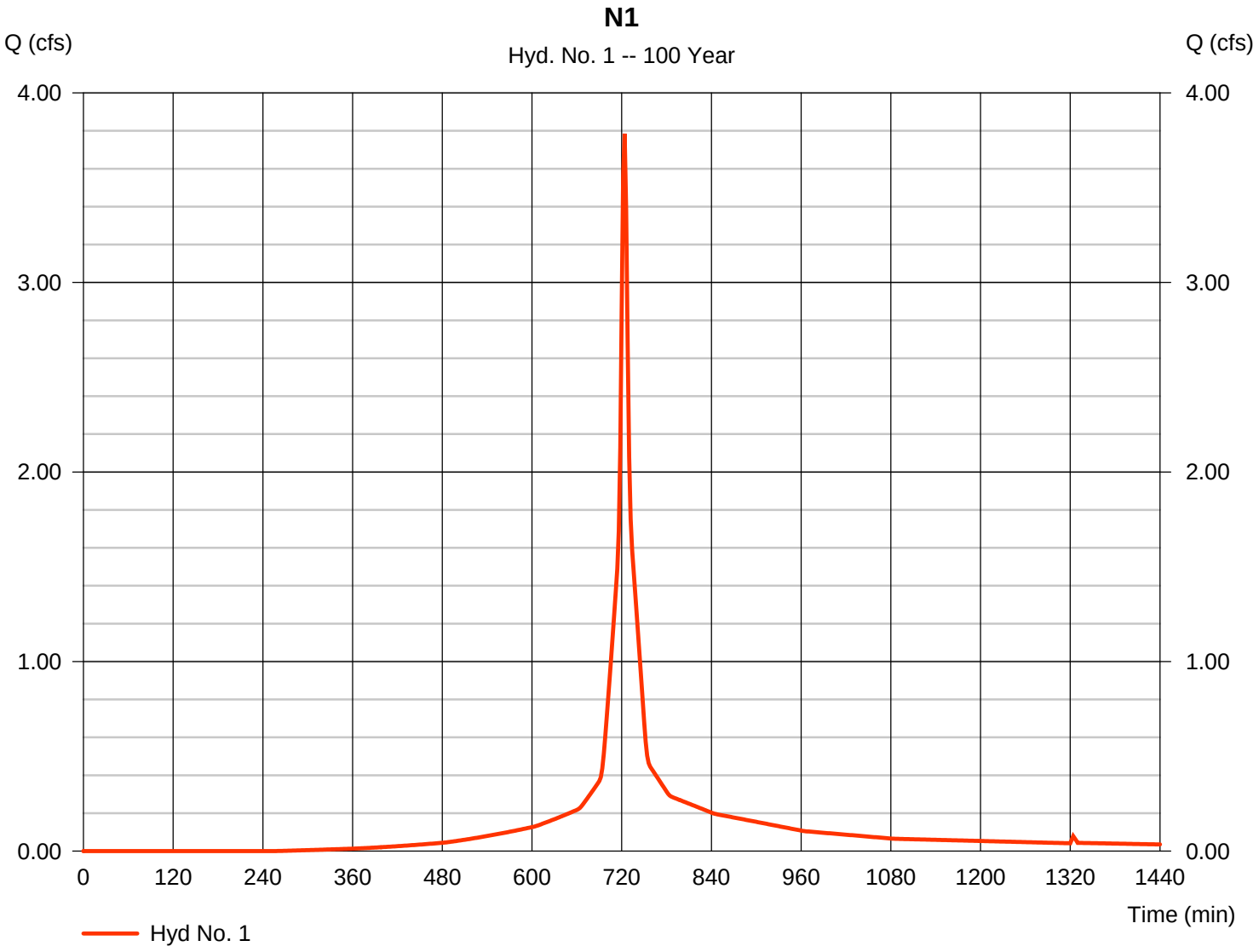
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.785	2	724	11,762	------	------	------	N1
2	Reservoir	1.531	2	736	3,923	1	68.64	4,746	N1 Infiltration Swale
3	SCS Runoff	0.720	2	726	2,458	------	------	------	N2
4	SCS Runoff	0.901	2	724	2,887	------	------	------	S1
5	Reservoir	0.689	2	728	2,589	4	77.14	646	S1 Dry Well
6	SCS Runoff	0.797	2	724	2,381	------	------	------	S2

Hydrograph Report

Hyd. No. 1

N1

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.785 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	11,762 cuft
Drainage area	=	0.539 ac	Curve number	=	84
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



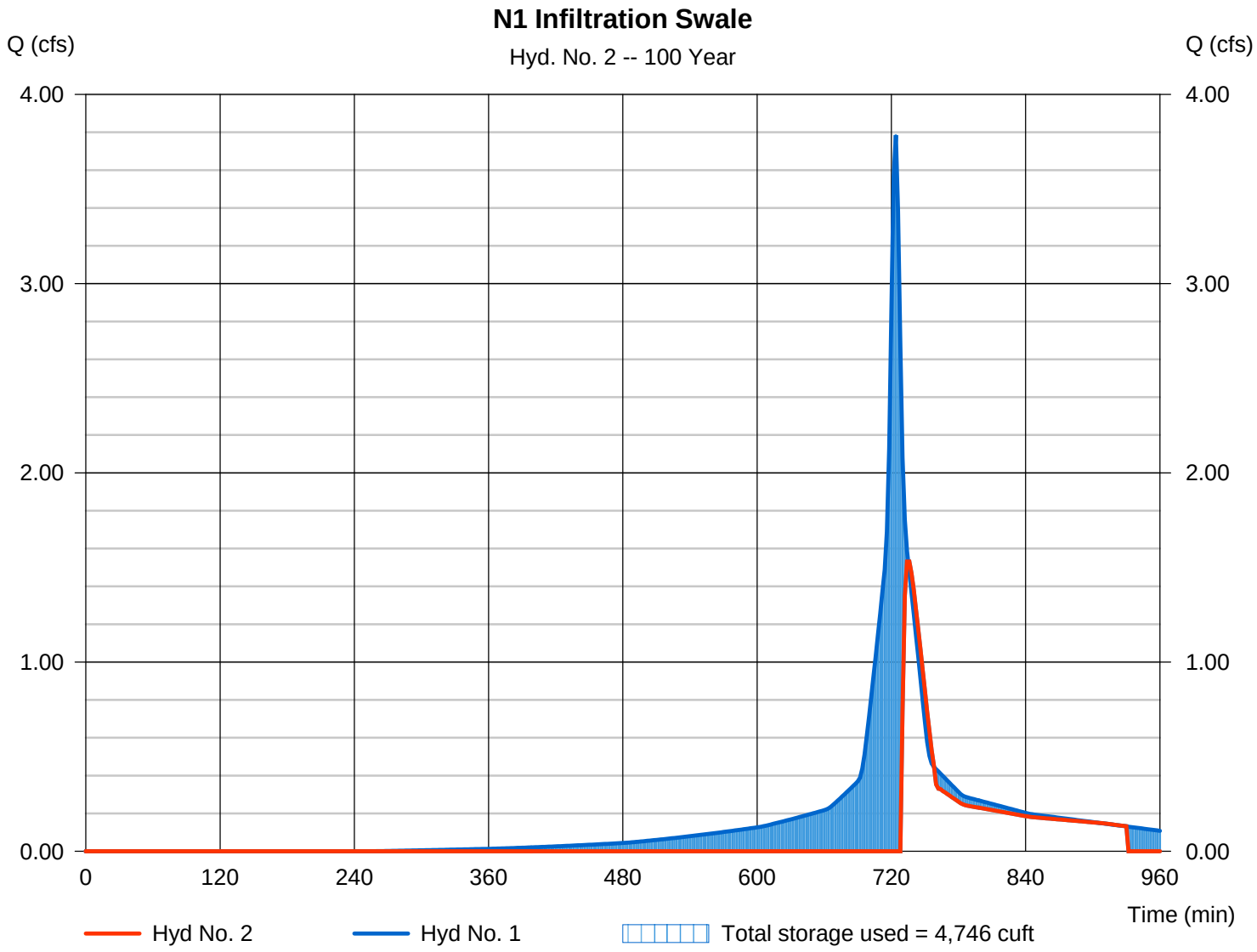
Hydrograph Report

Hyd. No. 2

N1 Infiltration Swale

Hydrograph type	=	Reservoir	Peak discharge	=	1.531 cfs
Storm frequency	=	100 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	3,923 cuft
Inflow hyd. No.	=	1 - N1	Max. Elevation	=	68.64 ft
Reservoir name	=	24-inch Perforated Pipe in Storage	Max. Storage	=	4,746 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

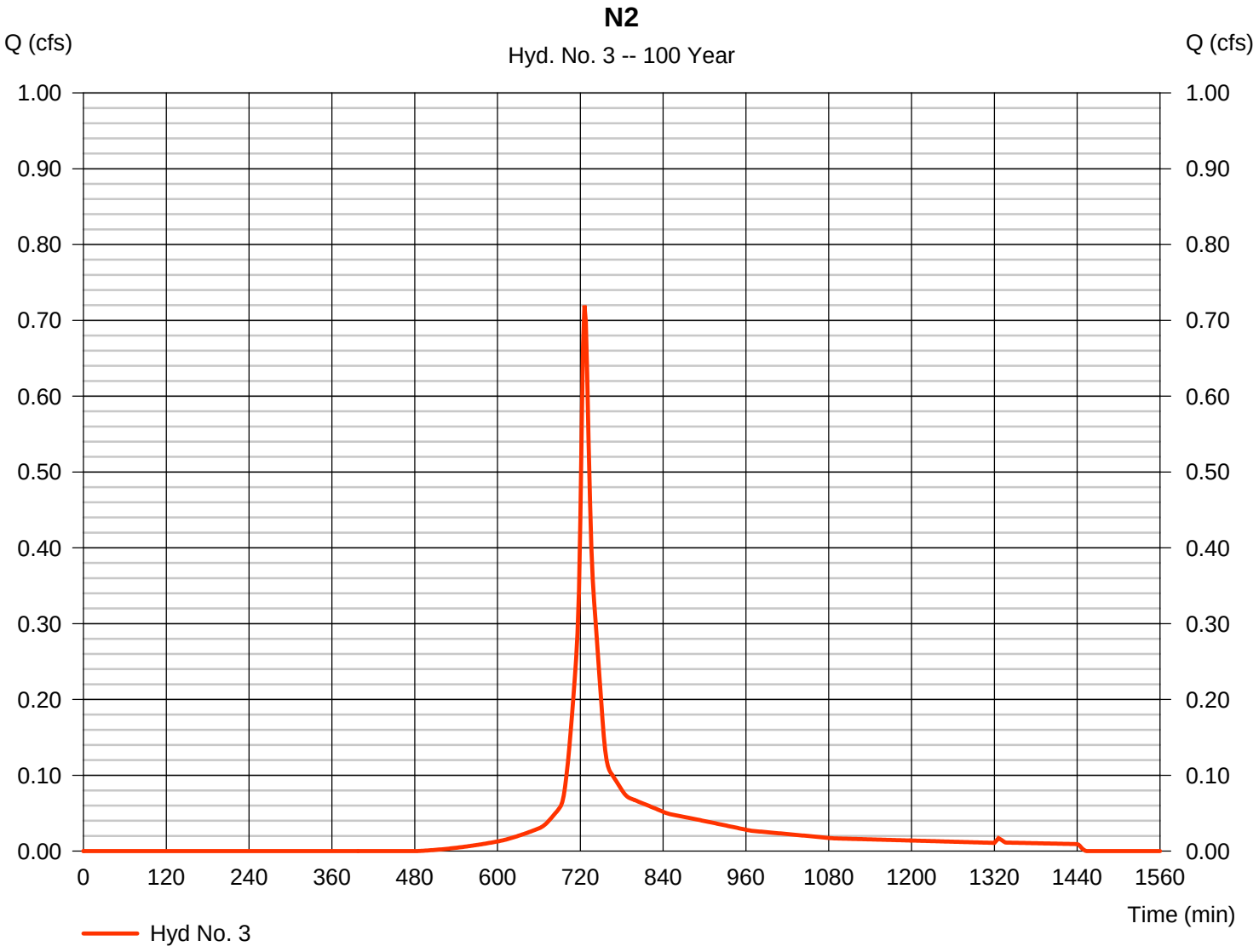


Hydrograph Report

Hyd. No. 3

N2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.720 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	2,458 cuft
Drainage area	=	0.150 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	8.90 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

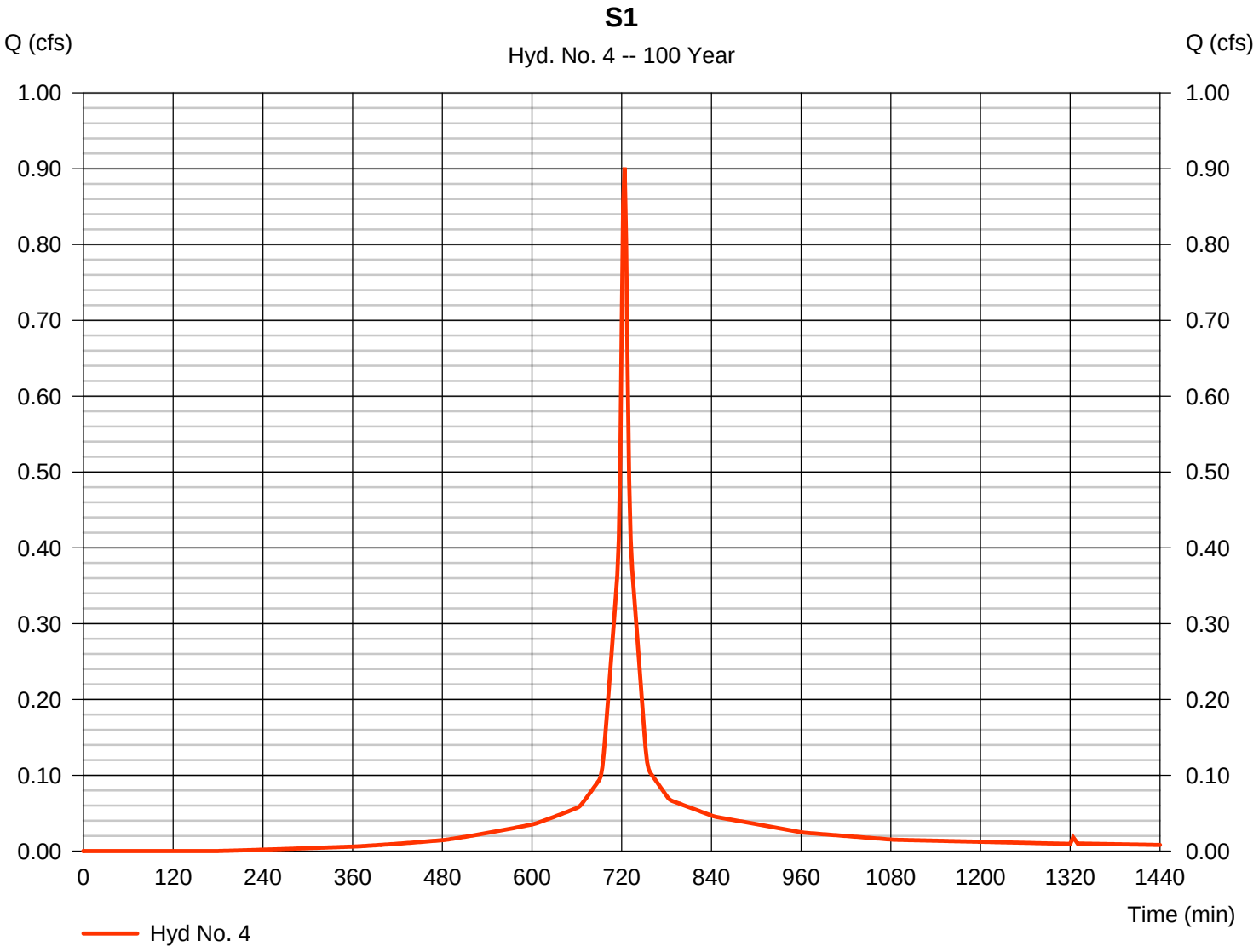


Hydrograph Report

Hyd. No. 4

S1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.901 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,887 cuft
Drainage area	=	0.121 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



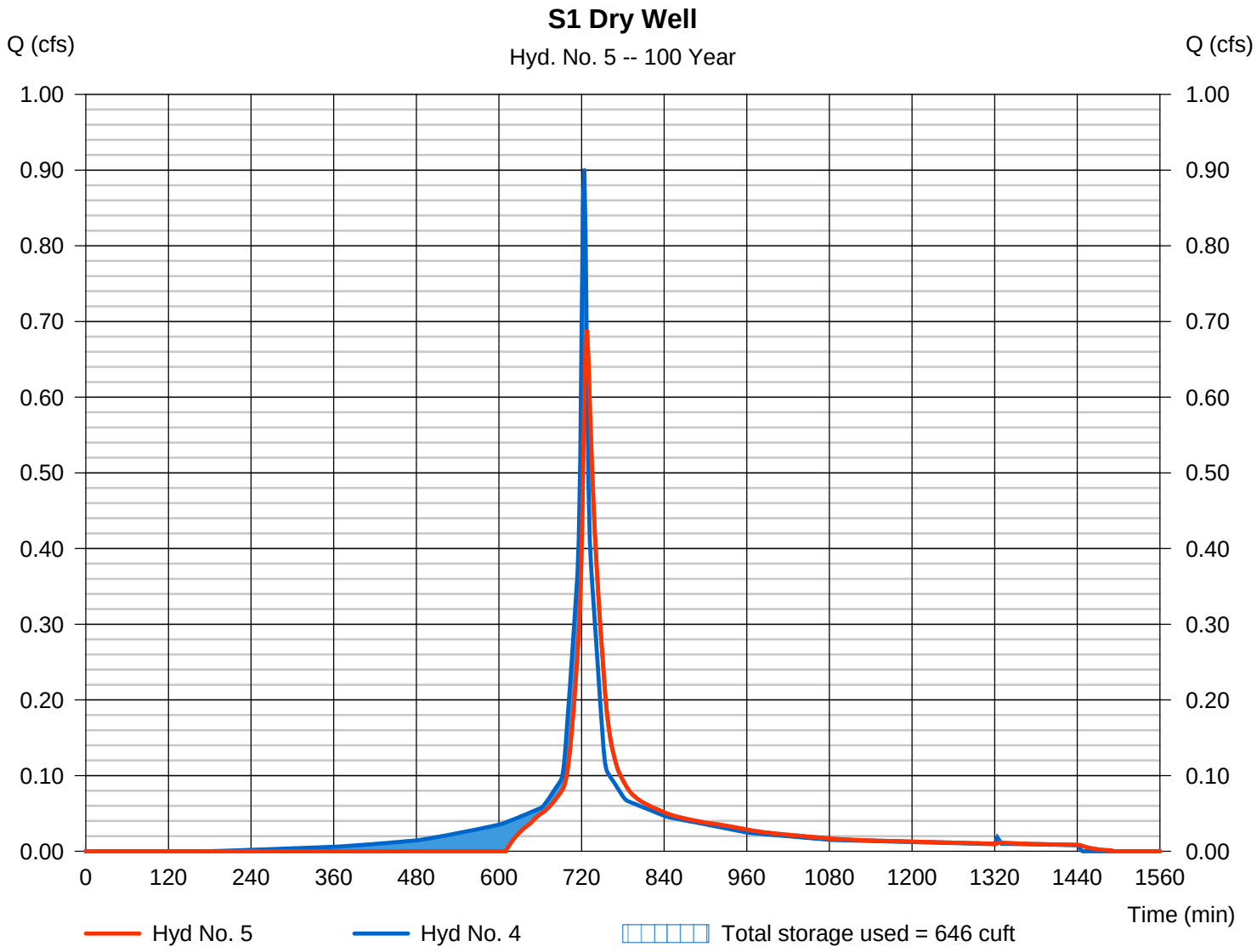
Hydrograph Report

Hyd. No. 5

S1 Dry Well

Hydrograph type	=	Reservoir	Peak discharge	=	0.689 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	2,589 cuft
Inflow hyd. No.	=	4 - S1	Max. Elevation	=	77.14 ft
Reservoir name	=	Drywell	Max. Storage	=	646 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

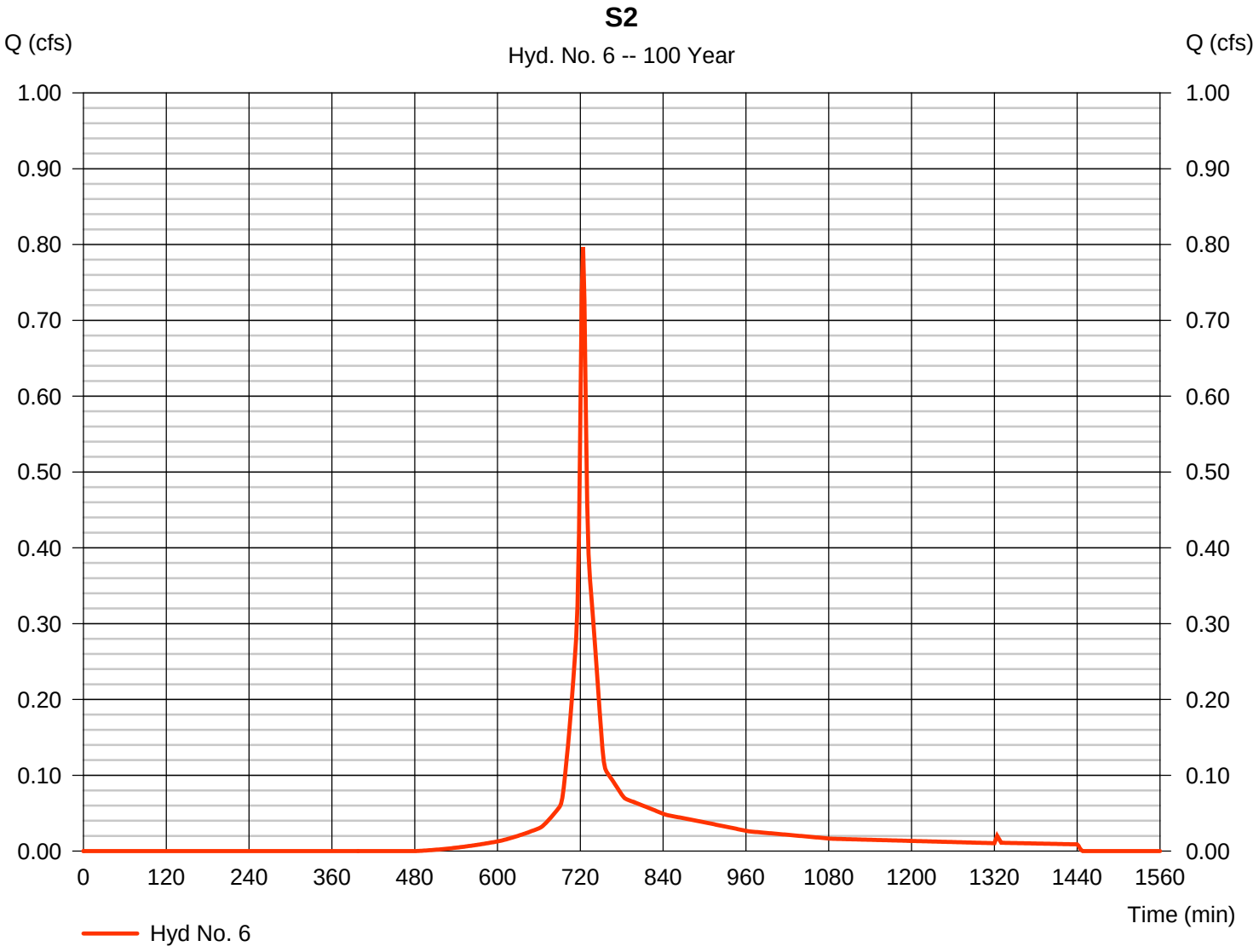


Hydrograph Report

Hyd. No. 6

S2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.797 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,381 cuft
Drainage area	=	0.155 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B 0507**
Project Location: **Darien, CT**
Description: **Dry Well Calculations**
Prepared By: **jcb** Date: **May 8 2018**

Drywell Number: **DW-1**

Storm Frequency = 100 YR Year
Drainage Area = 0.121 Acres
Runoff Coefficient, C = 0.71

Runoff - Seepage = Storage

Time (min)	Elapsed Time (sec)	I (In/hr)	A x C	Q = CxIxA (cfs)	Runoff (cf)	Seepage (cf)	Required Storage
0	0	0.00	0.08591	0.00	0	0.00	0
5	300	7.80	0.08591	0.67	201	6.18	195
10	300	6.50	0.08591	0.56	168	6.07	356
20	600	5.10	0.08591	0.44	263	18.10	601
30	600	4.10	0.08591	0.35	211	27.13	785
40	600	3.60	0.08591	0.31	186	33.93	937
50	600	3.20	0.08591	0.27	165	39.53	1062
60	600	2.70	0.08591	0.23	139	44.16	1157
70	600	2.50	0.08591	0.21	129	47.67	1239
80	600	2.30	0.08591	0.20	119	50.66	1306
90	600	2.10	0.08591	0.18	108	53.17	1362
100	600	2.00	0.08591	0.17	103	55.20	1409
110	600	1.80	0.08591	0.15	93	56.97	1445
120	600	1.70	0.08591	0.15	88	58.29	1475
130	600	1.60	0.08591	0.14	82	59.38	1498
140	600	1.60	0.08591	0.14	82	60.23	1520
150	600	1.50	0.08591	0.13	77	61.05	1536
160	600	1.40	0.08591	0.12	72	61.65	1547
170	600	1.30	0.08591	0.11	67	62.04	1552
180	600	1.30	0.08591	0.11	67	62.22	1556

Proposed Drywell Design

Diameter = 6 ft
Depth = 8 ft
Bottom Area = 50.27 ft^2
Side Area = 19 ft^2/ft

Stone Thickness = 1 ft
Voids in Stone = 40 %
Permeability = 7.087 in/hr
= 0.59 ft/hr

Drywell Storage = 226 ft^3
Stone Storage = 70 ft^3
Total Storage = 297 ft^3 (Storage volume provided)

Storage Required = 293 ft^3

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Water Quality Flow**
Prepared By: **JCB** Date: **May 7, 2018**

Required Water Quality Volume (WQv) - N1

Total Area in acres (A)	=	0.539
Impervious Area in acres	=	0.282
Pecenct of Impervious Area (I)	=	52
Volumetric Runoff Coefficient (R)		

$R = 0.05+0.009(I)$ = 0.521

$WQv = \frac{(1")(R)(A)}{12}$ = **0.0234 ac*ft** = **1019 cf**

Storage Provided = 4449 cf

Required Water Quality Flow (WQf)

WQv (Ac*ft)	=	0.0234
Drainage Area (Ac)	=	0.539

Q= WQv*12 / DA = 0.521 in

Runoff Depth in inches (Q)	=	**0.521** in
Design Precipitation in inches (P)	=	**1** in

$CN=1000/[10+5*P+10Q-10*(Q^2+1.25QP)^{1/2}]$ = 94 CN

From table 4-1 in chapter 4, TR-55

I_a = 0.128 in
I_a / P = 0.128

From Exhibit 4-11 in chapter 4, TR-55

q_u = 625 csm/in

Unit peak discharge in csm/in (q_u)	=	**625**
Area in square miles (A)	=	**0.001**
Runoff Depth in inches (Q)	=	**0.521**

$WQF=q_u*A*Q$ = 0.274 cfs

Calculated in accordence with the 2004 Connecticut Stormwater Quality Manual Sections 7.4.1 and 7.4.2

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Water Quality Flow**
Prepared By: **JCB** Date: **May 7, 2018**

Required Water Quality Volume (WQv) - S1

Total Area in acres (A)	=	0.121
Impervious Area in acres	=	0.083
Pecenct of Impervious Area (I)	=	69
Volumetric Runoff Coefficient (R)		

$R = 0.05+0.009(I)$ = 0.667

$WQv = \frac{(1")(R)(A)}{12}$ = **0.0067 ac*ft** = **293 cf**

Storage Provided = **297 cf**

Required Water Quality Flow (WQf)

WQv (Ac*ft)	=	0.0067
Drainage Area (Ac)	=	0.121

Q= WQv*12 / DA = **0.667 in**

Runoff Depth in inches (Q)	=	**0.667** in
Design Precipitation in inches (P)	=	**1** in

$CN=1000/[10+5*P+10Q-10*(Q^2+1.25QP)^{1/2}$ = **97 CN**

From table 4-1 in chapter 4, TR-55

I_a = **0.062 in**
I_a / P = **0.062**

From Exhibit 4-11 in chapter 4, TR-55

q_u = **700 csm/in**

Unit peak discharge in csm/in (q_u)	=	**700**
Area in square miles (A)	=	**0.000**
Runoff Depth in inches (Q)	=	**0.667**

$WQF=q_u*A*Q$ = **0.088 cfs**

Calculated in accordence with the 2004 Connecticut Stormwater Quality Manual Sections 7.4.1 and 7.4.2

EXISTING CTDOT SWALE
(APPROXIMATE LOCATION)

PROPOSED SWALE AND
INFILTRATION SYSTEM

PROPOSED DRYWELL

I-95

I-95

N

N1

N2

S1

S2

CB-01

RF-01

RF-02

YD-01

YD-02

RL

68

70

71

73

75

77

79

80

78

LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION PATH

DESIGN POINT S2

SCALE IN FEET
0 50' 100'
GRAPHIC SCALE

26 EAST LANE
DARIEN, CT

PROPOSED SUB-CATCHMENT
WATERSHED MAP

DATE: 05/07/2018
SCALE: AS NOTED
FIGURE WM-01

Tighe&Bond
Engineers | Environmental Specialists

May 17, 2018-2:27pm Plotted By: JCB1
Tighe & Bond, Inc. J:\B\B0509 Baywater\007 - 26 East Lane\Drawings_Figures\AutoCAD\Sheet\B0509-07-PR-WS.dwg

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Proposed Inlet C & Tc Calculations**
Prepared By: **jcb** Date: **May 15, 2018**

Designation: **RF-01**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.278	0.90	0.2502
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.000	0.30	0.0000
	0.278		0.2502

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	25	0.02	0.5

Total Tc = 0.5 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **RF-02a**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.030	0.90	0.0273
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.000	0.30	0.0000
	0.030		0.0273

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	25	0.02	0.5

Total Tc = 0.5 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Proposed Inlet C & Tc Calculations**
Prepared By: **jcb** Date: **May 15, 2018**

Designation: **RF-02b**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.034	0.90	0.0306
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.000	0.30	0.0000
	0.034		0.0306

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	25	0.02	0.5

Total Tc = 0.5 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **CB-01**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.152	0.90	0.1370
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.173	0.30	0.0519
	0.325		0.1889

Weighted C: 0.58

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	150	0.18	8.1

Total Tc = 8.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Proposed Inlet C & Tc Calculations**
Prepared By: **jcb** Date: **May 15, 2018**

Designation: **YD-01**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.000	0.90	0.0000
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.027	0.30	0.0080
	0.027		0.0080

Weighted C: 0.30

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	58	0.2	3.6

Total Tc = 3.6 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **YD-02**
Location:

Cover Type	Area, ac	Coef.	A x C
Pavement	0.000	0.90	0.0000
Wooded	0.000	0.50	0.0000
Landscaped and Lawns	0.059	0.30	0.0177
	0.059		0.0177

Weighted C: 0.30

Time of Concentration

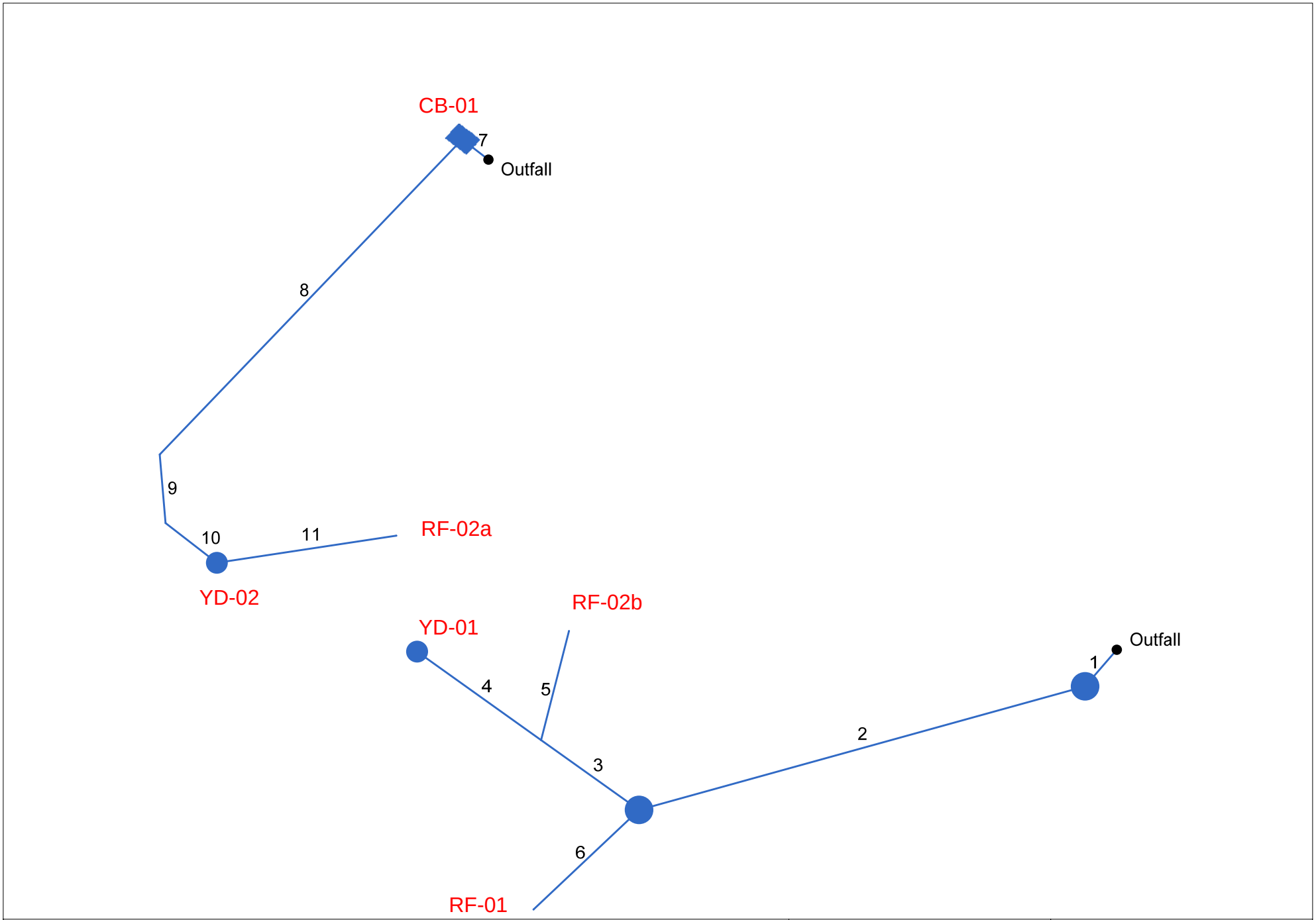
(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	84	0.27	4.3

Total Tc = 4.3 Min.
Min Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: 26 East Lane proposed storm sewers.stm	Number of lines: 11	Date: 5/15/2018

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	DMH-01 TO INFILTRATION	2.08	12	Cir	7.699	65.00	65.00	0.000	65.62	65.74	0.11	65.85	End	Manhole
2	DMH-02 TO DMH-01	2.10	10	Cir	69.806	65.75	66.72	1.390	66.29	67.37	n/a	67.37	1	Manhole
3	CONNECT TO DMH-02	0.27	10	Cir	18.593	66.72	67.06	1.829	67.37	67.28	0.07	67.28	2	None
4	YD-01 TO ROOF LEADER CONNE	0.07	10	Cir	23.591	67.06	67.50	1.865	67.28	67.62	n/a	67.62 j	3	Grate
5	RF-02b to CONNECT	0.22	6	Cir	18.354	67.06	67.24	0.981	67.28	67.48	0.09	67.48	3	None
6	ROOF LEADER 1	2.08	8	Cir	22.700	66.72	67.17	1.982	67.39*	67.96*	0.55	68.51	2	None
7	CB-01 TO INFILTRATION	1.75	12	Cir	5.142	65.00	65.00	0.000	65.56	65.66	0.24	65.89	End	Grate
8	BEND TO CB-01	0.36	10	Cir	68.671	65.50	65.84	0.495	65.89	66.10	n/a	66.10 j	7	None
9	BEND TO BEND	0.36	10	Cir	14.102	65.84	65.91	0.496	66.10	66.17	0.07	66.24	8	None
10	YD-02 TO BEND	0.37	10	Cir	10.093	65.91	65.96	0.495	66.24	66.25	0.09	66.34	9	Grate
11	RF-02a TO YD-02	0.22	6	Cir	27.215	65.96	66.23	0.992	66.34	66.47	n/a	66.47 j	10	None

Project File: 26 East Lane proposed storm sewers.stm | Number of lines: 11 | Run Date: 5/17/2018

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	7.699	0.00	0.34	0.00	0.00	0.29	0.0	8.7	7.2	2.08	0.00	3.72	12	0.00	65.00	65.00	65.62	65.74	70.00	69.26	DMH-01 TO INFIL
2	1	69.806	0.00	0.34	0.00	0.00	0.29	0.0	8.5	7.3	2.10	2.80	5.12	10	1.39	65.75	66.72	66.29	67.37	69.26	71.70	DMH-02 TO DMH
3	2	18.593	0.00	0.06	0.00	0.00	0.04	0.0	7.9	7.4	0.27	3.21	1.43	10	1.83	66.72	67.06	67.37	67.28	71.70	71.34	CONNECT TO D
4	3	23.591	0.03	0.03	0.30	0.01	0.01	5.0	5.0	8.2	0.07	3.24	1.12	10	1.87	67.06	67.50	67.28	67.62	71.34	70.50	YD-01 TO ROOF
5	3	18.354	0.03	0.03	0.90	0.03	0.03	5.0	5.0	8.2	0.22	0.60	2.53	6	0.98	67.06	67.24	67.28	67.48	71.34	70.50	RF-02b to CONN
6	2	22.700	0.28	0.28	0.90	0.25	0.25	5.0	5.0	8.2	2.08	1.84	5.95	8	1.98	66.72	67.17	67.39	67.96	71.70	80.00	ROOF LEADER 1
7	End	5.142	0.33	0.42	0.58	0.19	0.24	8.1	8.1	7.4	1.75	0.00	3.52	12	0.00	65.00	65.00	65.56	65.66	65.43	68.50	CB-01 TO INFILT
8	7	68.671	0.00	0.09	0.00	0.00	0.05	0.0	6.0	7.9	0.36	1.67	1.93	10	0.50	65.50	65.84	65.89	66.10	68.50	72.00	BEND TO CB-01
9	8	14.102	0.00	0.09	0.00	0.00	0.05	0.0	5.6	8.0	0.36	1.67	2.45	10	0.50	65.84	65.91	66.10	66.17	72.00	71.00	BEND TO BEND
10	9	10.093	0.06	0.09	0.30	0.02	0.05	5.0	5.4	8.1	0.37	1.67	1.99	10	0.50	65.91	65.96	66.24	66.25	71.00	70.50	YD-02 TO BEND
11	10	27.215	0.03	0.03	0.90	0.03	0.03	5.0	5.0	8.2	0.22	0.61	1.92	6	0.99	65.96	66.23	66.34	66.47	70.50	70.80	RF-02a TO YD-02

Project File: 26 East Lane proposed storm sewers.stm

Number of lines: 11

Run Date: 5/17/2018

NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box

APPENDIX D

26 East Lane

Housing

Darien, Connecticut

Maintenance and Inspection Plan

May 22, 2018

The initial inspection will be made during an intense rainfall to check the adequacy of the yard drains, catch basins, roof leaders, piping, infiltration system, system outlet and drainage swale.

The following is a checklist of items that will be checked and maintained during scheduled maintenance operations.

Drainage Structures: The Owner will be responsible for cleaning the catch basins, yard drains, manholes, piping, and outlet protection on their property. A Connecticut licensed hauler shall clean the sumps, and legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed.

Each catch basin and yard drain shall be inspected every six months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Underground Infiltration: The underground infiltration system will be cleaned of all silt, debris and sediment from the inlet structure, outlet structure and the chamber lengths. The dry well will be inspected an cleaned of debris build-up

Pavement: Paved areas shall be swept periodically by the Owner to clean trash and other debris. The Owner will sweep paved areas on its property in the spring to remove winter accumulations of road sand.

Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

Drainage Structures Inspection

Each catch basin and yard drain shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand and debris from catch basins as necessary and dispose of legally.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

Underground Infiltration

The underground infiltration system shall be inspected annually and will be cleaned of all silt, debris and sediment from the inlet structure and the chamber lengths.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

Pavement Inspection

Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Sweep accumulated sediment and debris from the paved areas. Clean paved areas as necessary during the remainder of the year.

Date (MM/DD/YY)	Company/Person	Supervising Team Member	Comments

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **26 East Lane**
Project Number: **B0509-007**
Project Location: **Darien, CT**
Description: **Sanitary Lateral Calculation**
Prepared By: **JCB** Date: **May 16, 2018**

Proposed Average Daily Flow from Site

Residential

150	gal per person per day (per CT DPH Public Health Code Technical Standards Table 4, Residential-Community Living
24	Assumed residents - two per unit
3600	gal per day - Residential

Office

20	gal per person per day (per CT DPH Public Health Code Technical Standards Table 4, Office)
2	Number of Offices
40	gal per day - Office

Total from Proposed Site

3640	gal per day, total	
2.53	gal per minute	
Average Daily Flow =	0.006	cfs
Peaking Factor=	5	
Peak Flow from Proposed Site =	0.028	cfs

Existing Average Daily Flow

Residential

150	gal per person per day (per CT DPH Public Health Code Technical Standards Table 4
8	Assumed number of Beds
1200	gal per day - Residential
0.83	gal per minute

Average Daily Flow =	0.002	cfs
Peaking Factor=	5	
Peak Flow from existing houses =	0.009	cfs

Total Peak Flow to Existing Town Main= 0.037

Proposed Sanitary Lateral Capacity

6" PVC lateral

$$\text{Capacity} = \frac{1.49 \times R^{2/3} \times S^{1/2} \times A}{n}$$

R =	0.125
S = 2% =	0.0100
A =	0.196
n =	0.009

Capacity = **0.813 cfs**

Existing 8" Town PVC Main

$$\text{Capacity} = \frac{1.49 \times R^{2/3} \times S^{1/2} \times A}{n}$$

R =	0.163
S = 3% =	0.0300
A =	0.196
n =	0.009

Existing 8" Town Main Capacity= 1.677 cfs